

ITALY'S GREAT HORROR OF EARTHQUAKE AND TIDAL WAVE









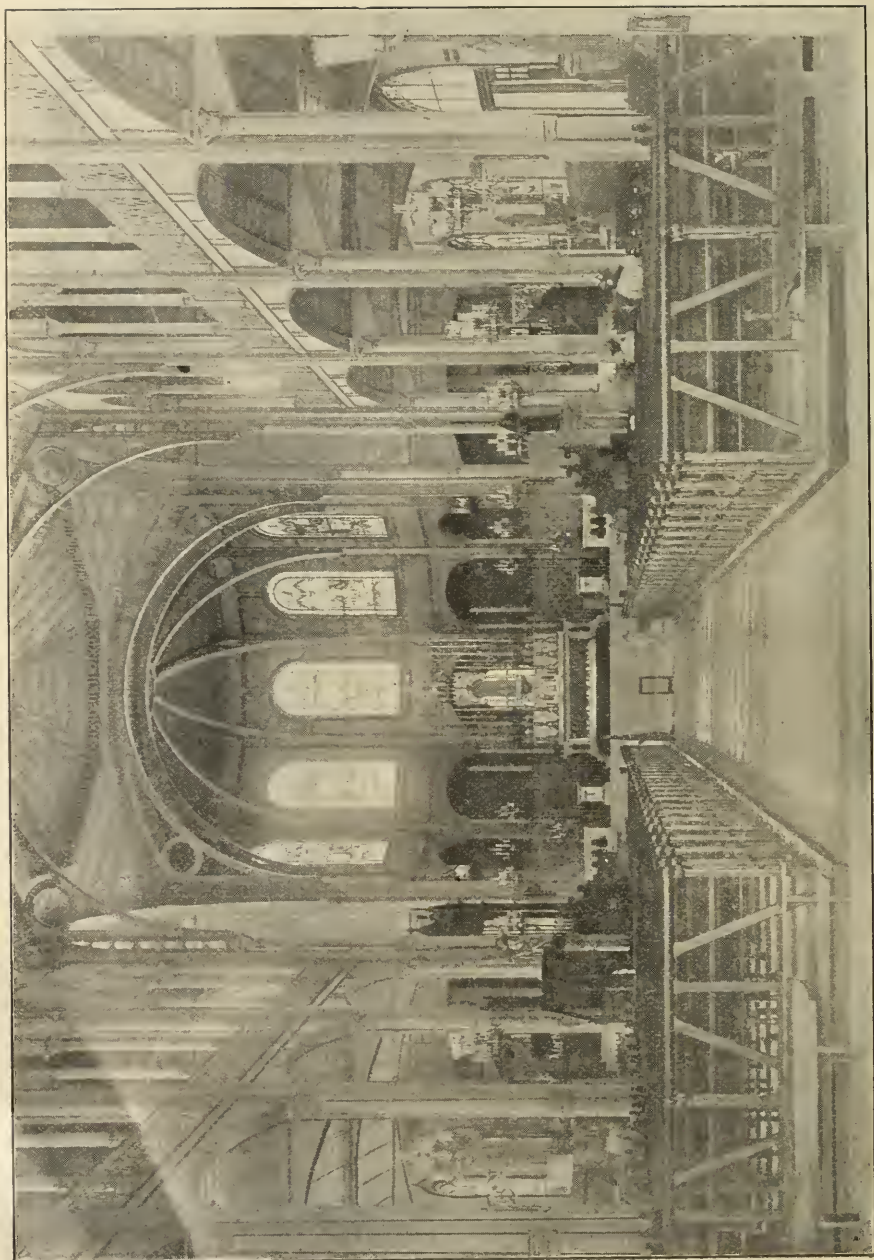
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A black and white illustration of a woman in a long, flowing dress leaning over a large, rectangular stone monument. The monument has the words "IN MEMORIAM" carved into its top surface. To the left of the woman, there is a small, classical-style column on a pedestal. The background is a chaotic scene of ruins, with debris, broken stone, and a small, dark, domed structure visible in the distance. The overall mood is one of mourning and remembrance.

IN MEMORIAM

OF
**ITALY'S
DEAD**

DECEMBER 28TH
1908

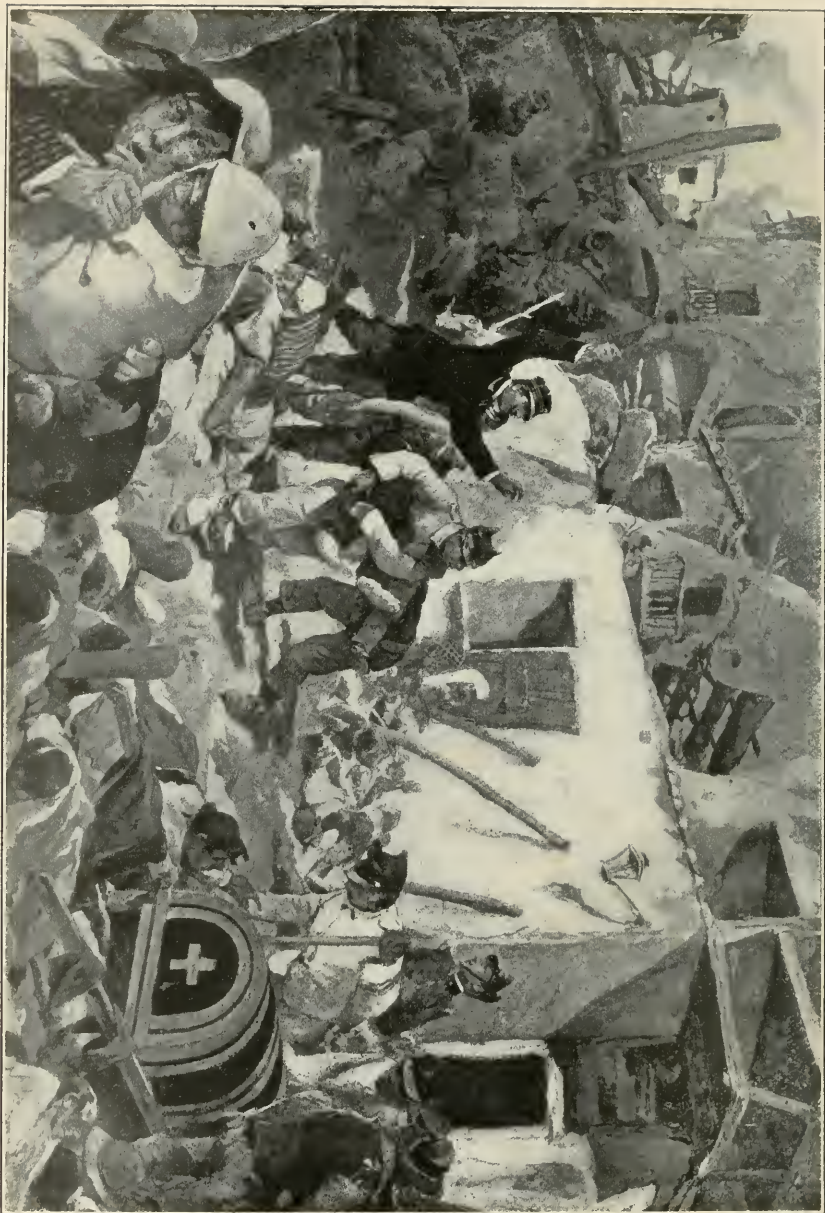


INTERIOR VIEW OF A MAGNIFICENT CATHEDRAL THAT WAS DESTROYED.



ARRIVAL AT CATANIA OF EARTHQUAKE REFUGEES
FROM MESSINA

PRIESTS COMFORTING THE STRICKEN SURVIVORS, WHO ARE
HEARTBROKEN BY THEIR TERRIBLE EXPERIENCES



RESCUING VICTIMS OF THE GREATEST DISASTER FOR CENTURIES
SCENE AFTER THE TERRIBLE EARTHQUAKE IN MESSINA

WATER LINE

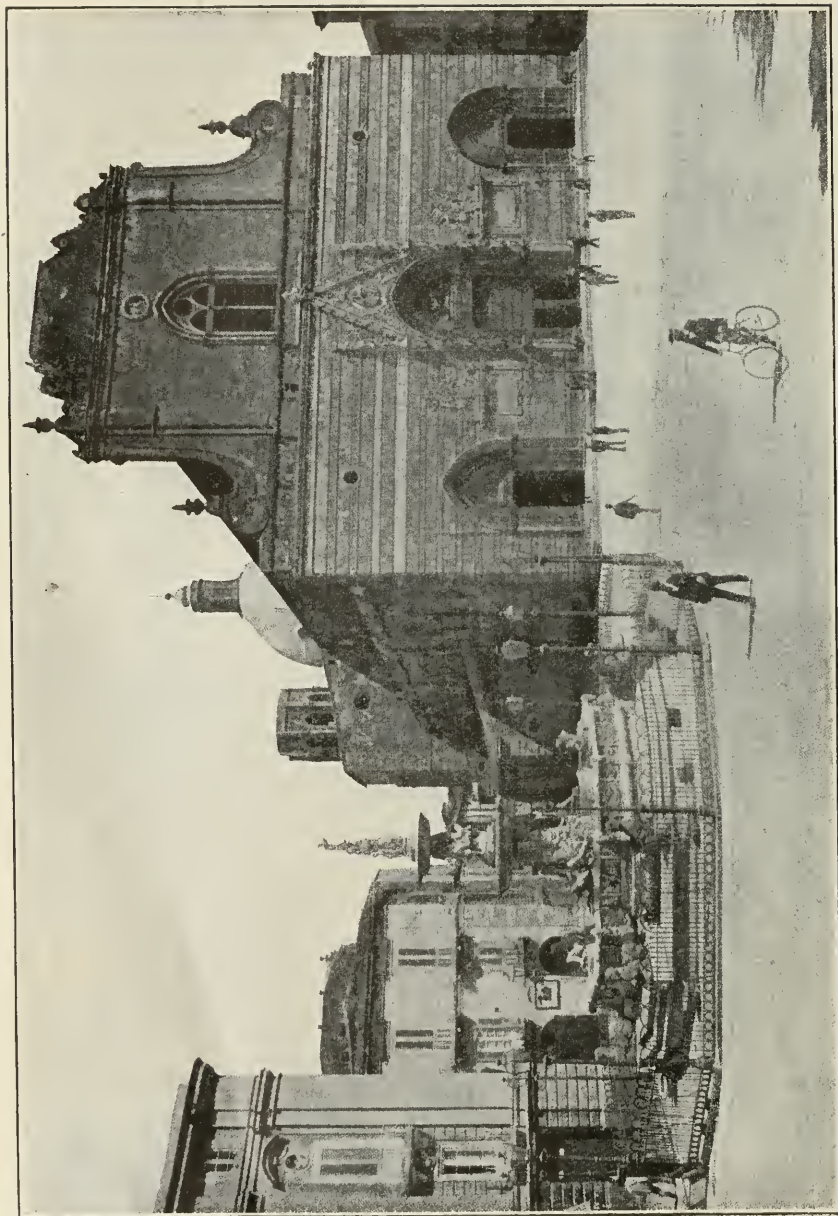
OCEAN

STEAM

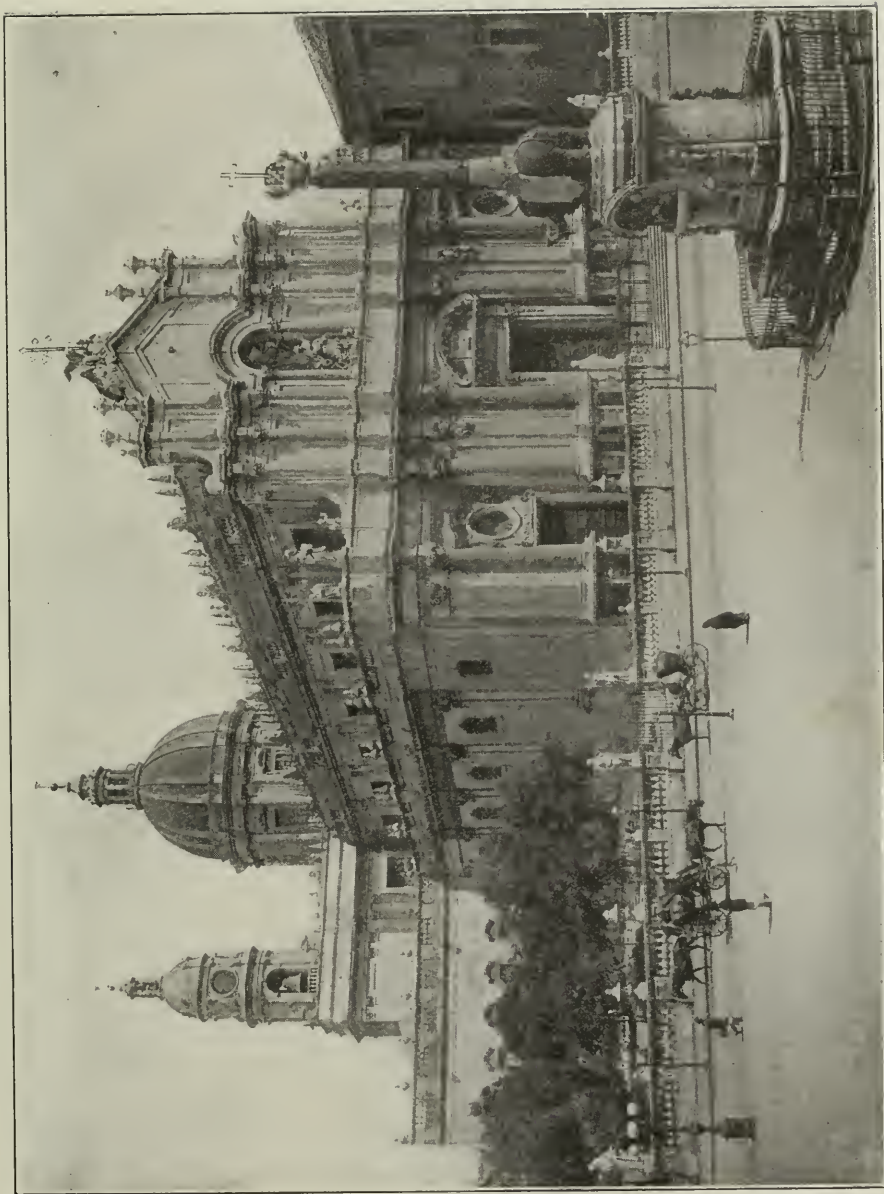
FLUID OR SEMI-FLUID LAVA

DIAGRAM SHOWING HOW VOLCANIC ERUPTIONS ARE PRODUCED

WATER COMING IN CONTACT WITH MOLTEN LAVA IN THE VOLCANO'S INTERIOR GENERATES STEAM AND CAUSES AN EXPLOSION AS STEAM DOES IN A WEAK BOILER



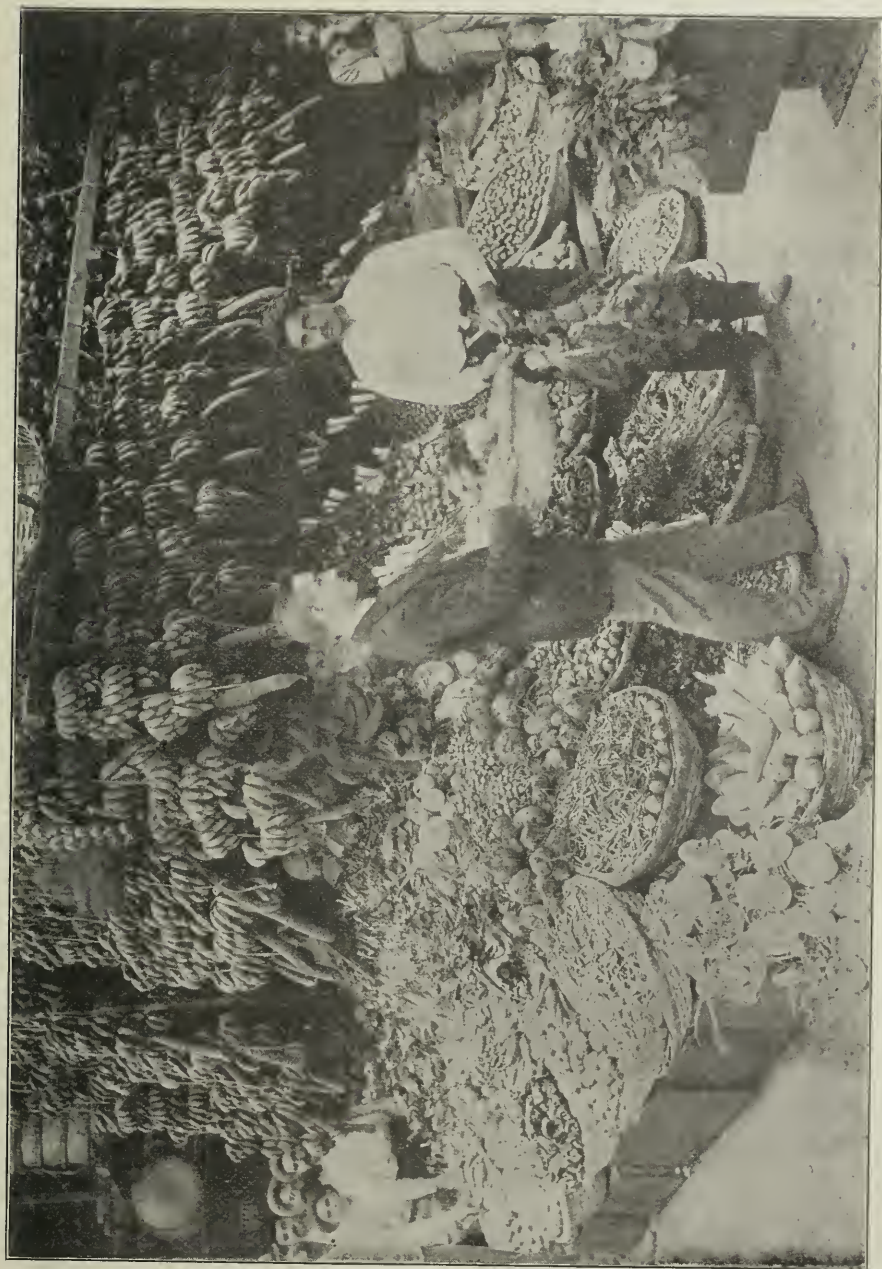
CATHEDRAL AT MESSINA,
SHOWING FOUNTAIN, DEL MONTORSOLI, IN THE FOREGROUND



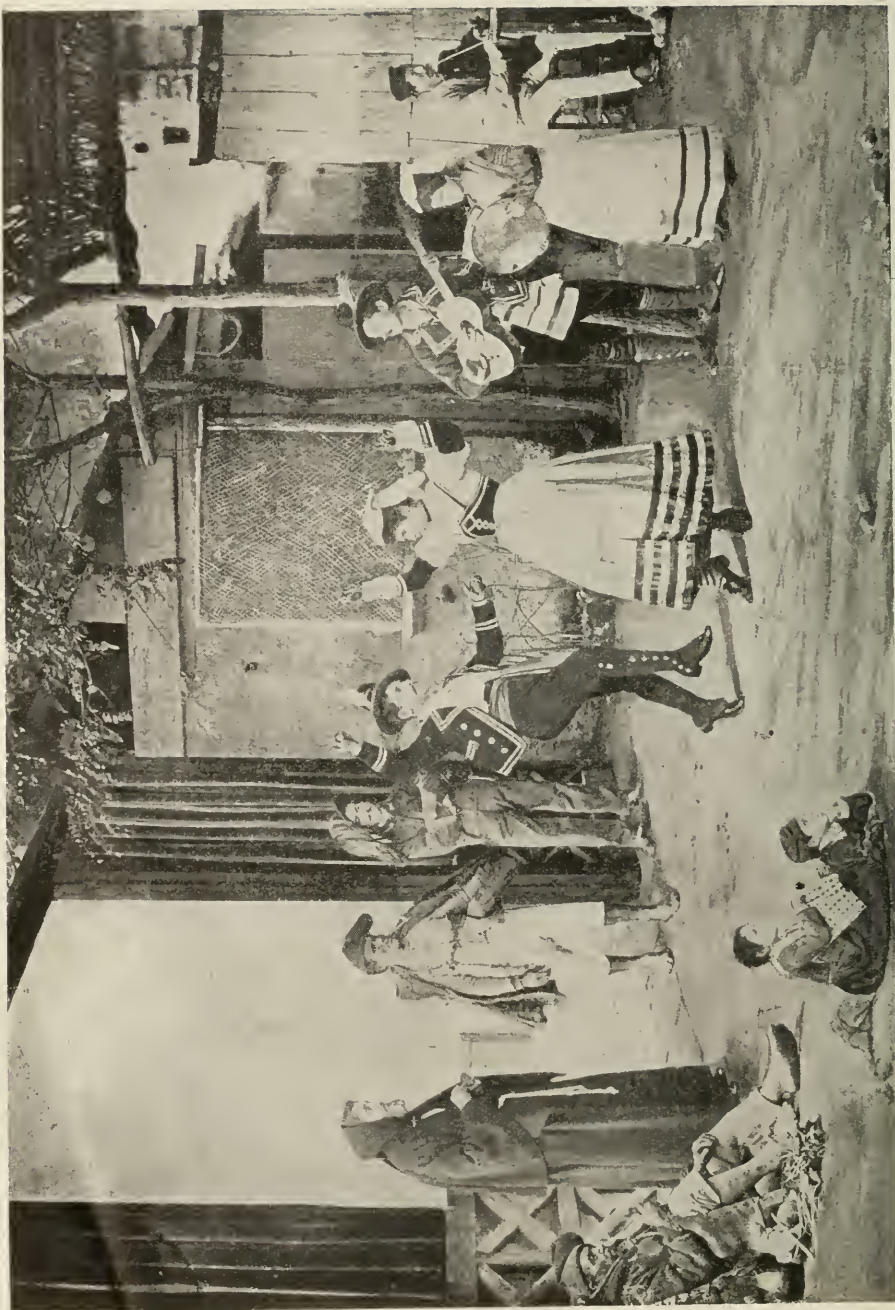
VIEW OF THE CATHEDRAL AT CATANIA, SICILY,
CATANIA WAS SWEEPED BY TIDAL WAVE, CAUSING GREAT DESTRUCTION OF PROPERTY AND LOSS OF LIFE.



INTERIOR VIEW OF RESIDENCE OF A WEALTHY MERCHANT OF MESSINA.



SCENE IN THE FRUIT MARKET AT MESSINA

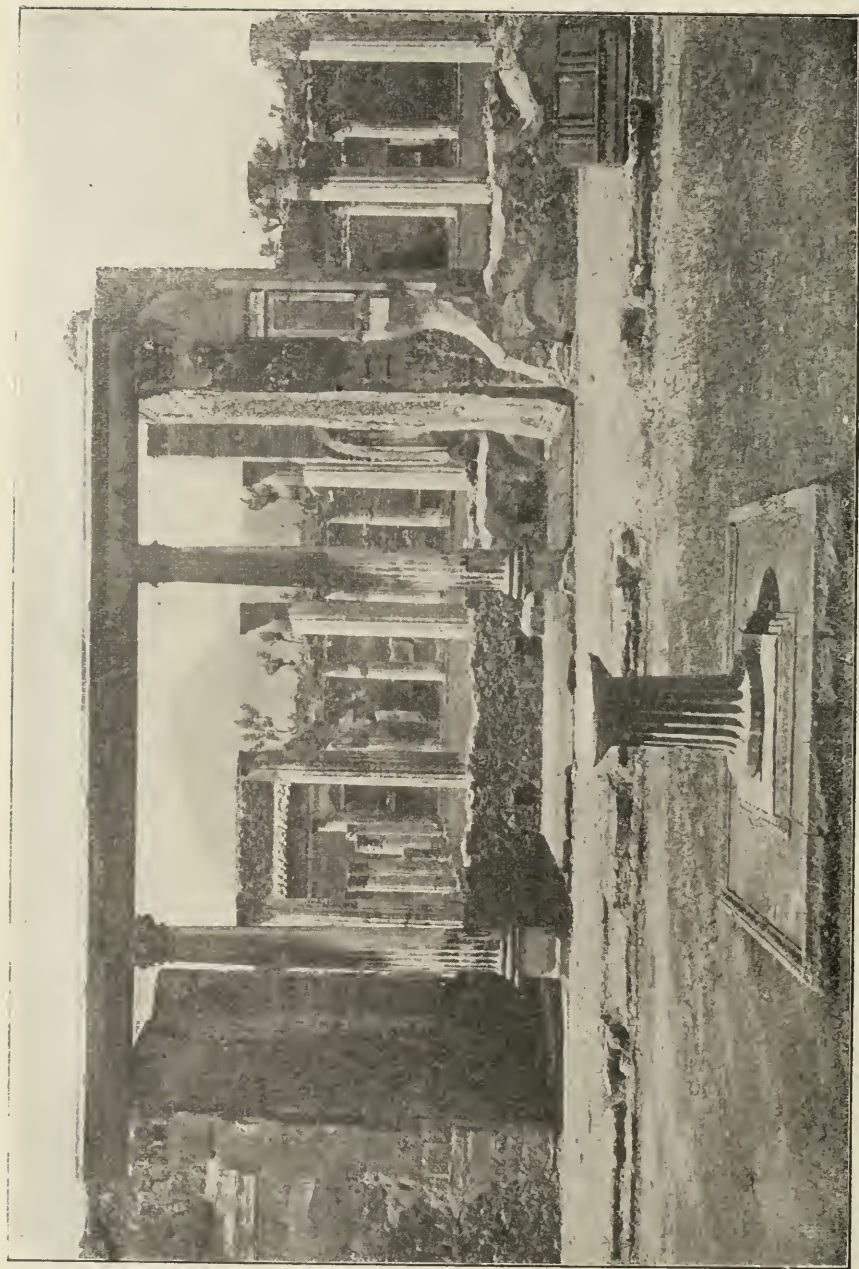


THE TARANTELLA DANCE, SOUTHERN ITALY.

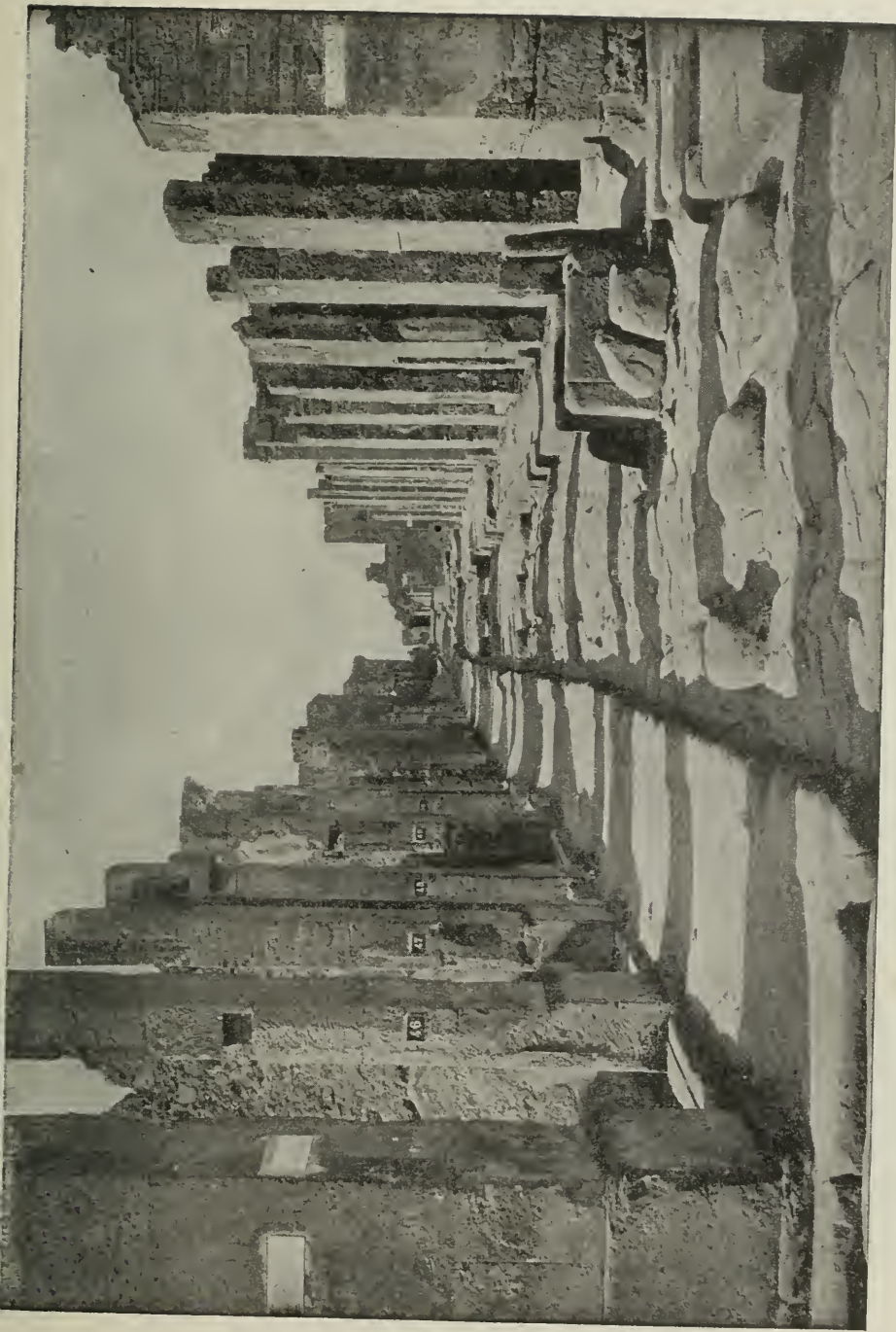
THIS DANCE IS SO CALLED FROM A POPULAR NOTION OF ITS BEING A REMEDY FOR THE POISONOUS BITE OF THE TARANTULA.



STRAITS OF MESSINA, WHICH SEPARATES SICILY FROM ITALY.



RUINS OF HOUSE OF THE FAWN, POMPEII—SHOWING MOUNT VESUVIUS
IN THE DISTANCE



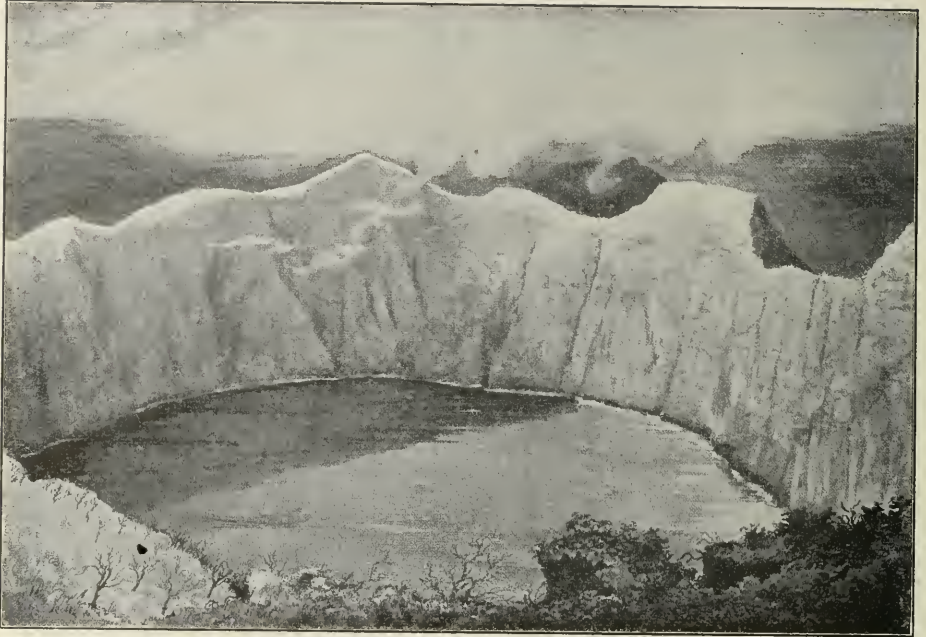
EXCAVATED PORTION OF THE STREET CALLED STRADIA IN POMPEII, WHICH WAS BURIED UNDER THE ASHES



STREET SCENE, REGGIO, CALABRIA.



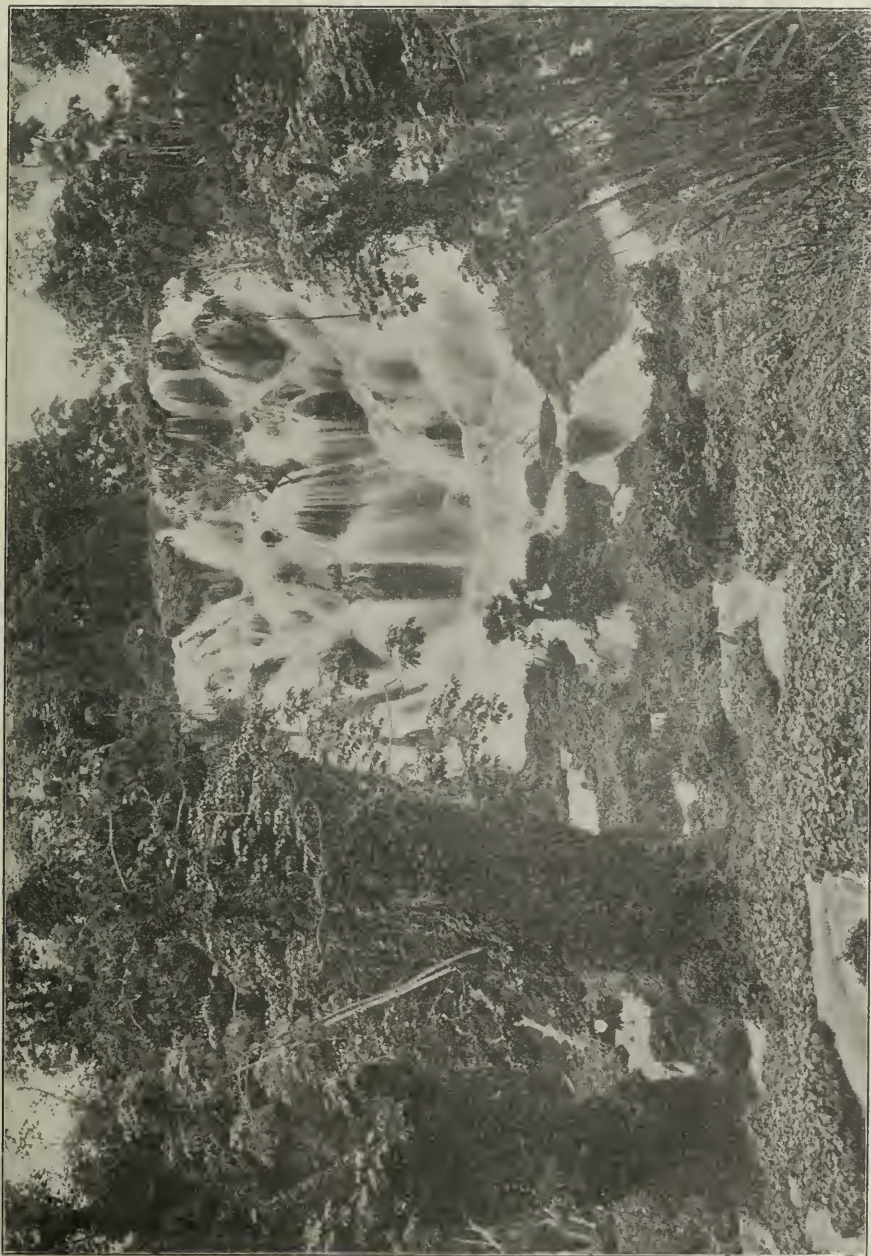
WOMAN OF SICILY DRESSED FOR THE CARNIVAL.



THE CRATER OF MOUNT SOUFRIERE, ST. VINCENT, THE ERUPTION
OF WHICH DEVASTATED MUCH OF THAT ISLAND



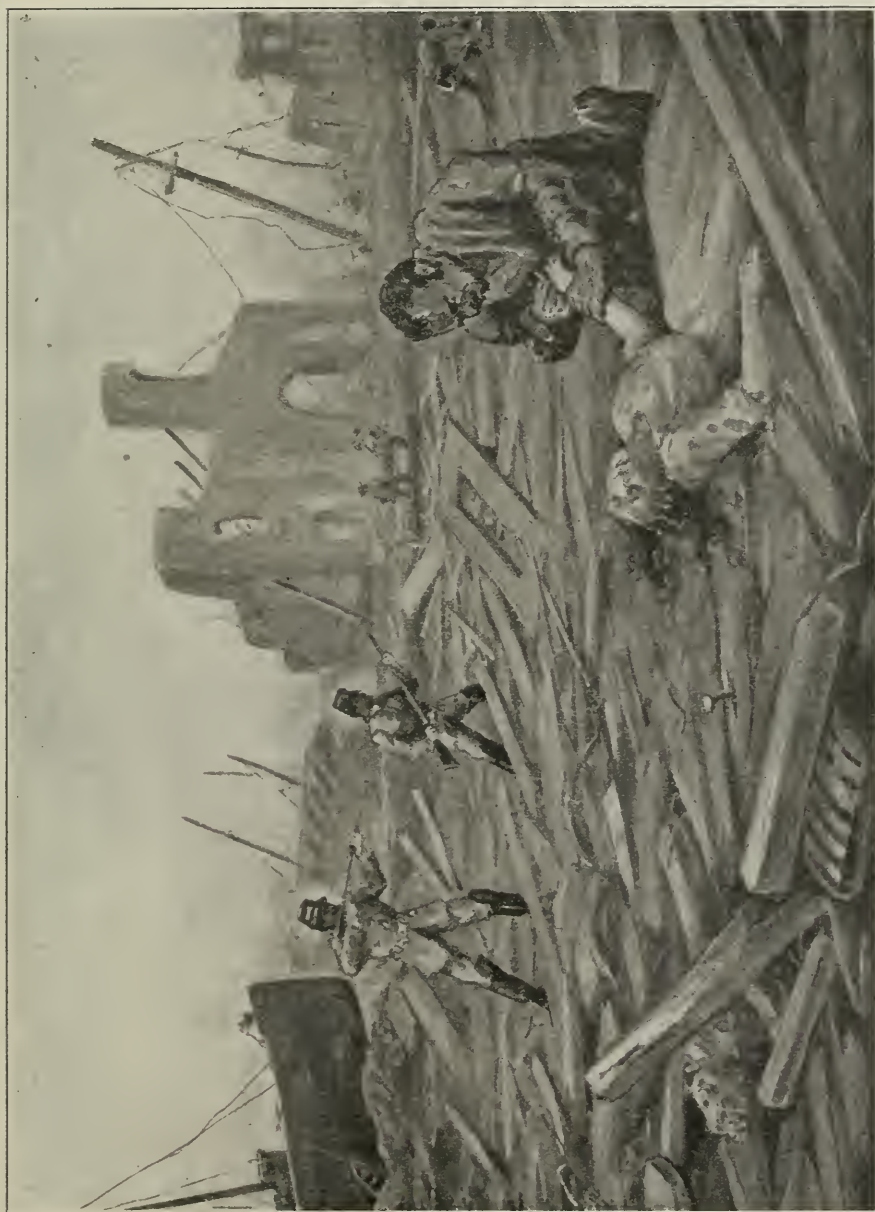
SCENE OF THE TERRIBLE CALAMITY IN MARTINIQUE, WHICH
CAUSED THE DESTRUCTION OF ST. PIERRE



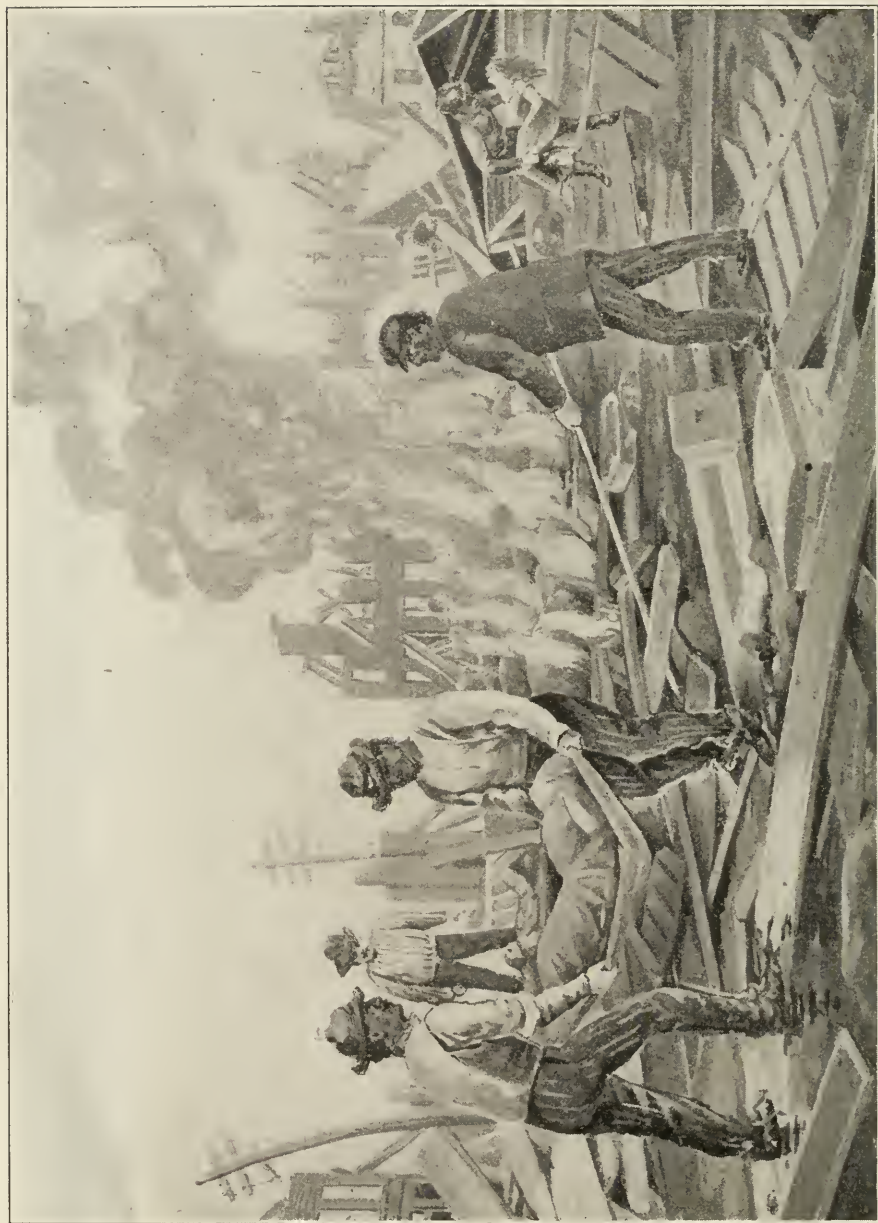
FAMOUS WATERFALL NEAR MESSINA IN SICILY



SCENE ON A COUNTRY ROAD NEAR REGGIO IN CALABRIA.



SHOOTING VANDALS ENGAGED IN ROBBING THE BODIES OF THE VICTIMS



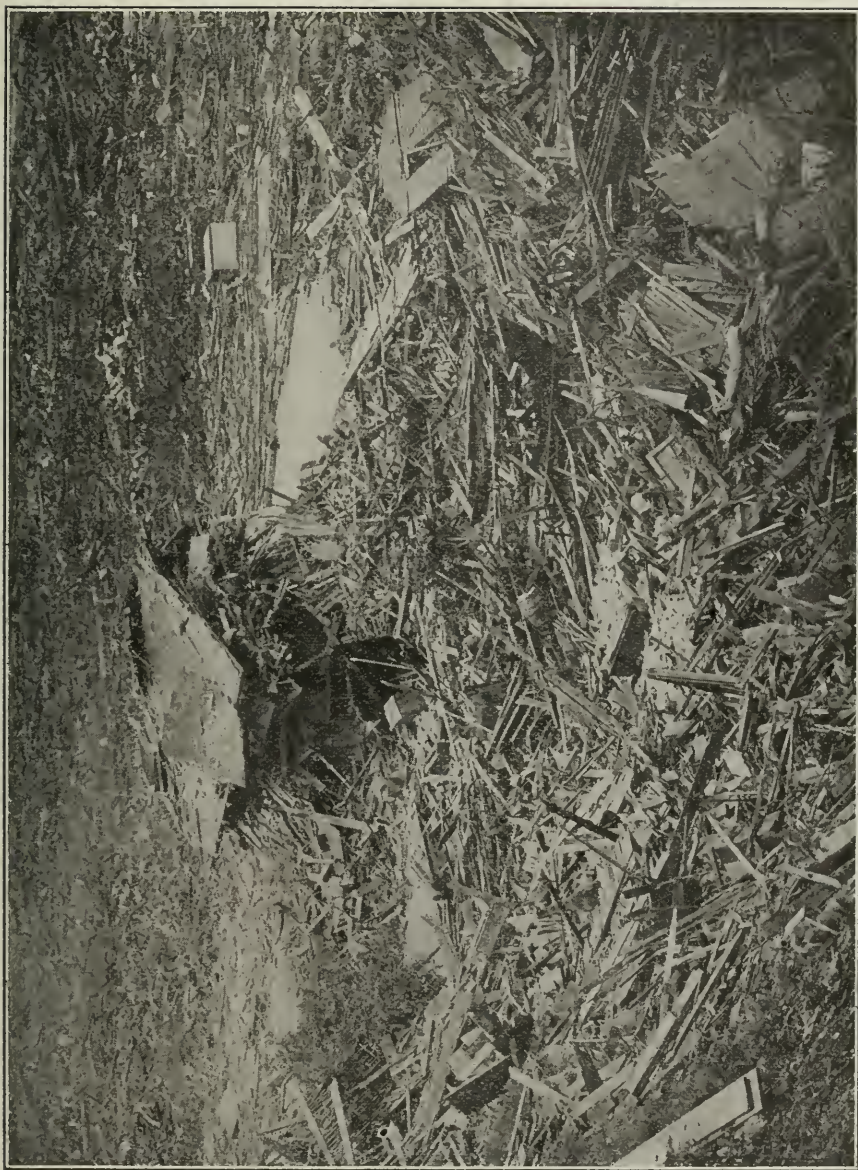
CREMATING BODIES EXCAVATED FROM THE RUINS



SCENE SHOWING THE DEVASTATION OF FIRE IN PALMI



PART OF THE RUINS OF REGGIO, FROM WHICH BUT FEW ESCAPED ALIVE



SCENE SHOWING THE TERRIBLE DESTRUCTION WROUGHT BY THE EARTHQUAKE AND
TIDAL WAVE AT BAGNARA IN CALABRIA



CHURCH OF SAN GREGORIO, MESSINA, DESTROYED
BY THE EARTHQUAKE



RUINS OF THE OLD GREEK THEATRE AT TAORMINA NEAR MESSINA



SCENE IN MESSINA, SHOWING HARBOR, WHARVES AND SHIPPING



GENERAL VIEW OF RUINS NEAR MESSINA, SHOWING HAVOC CAUSED BY
EARTHQUAKE AND TIDAL WAVE



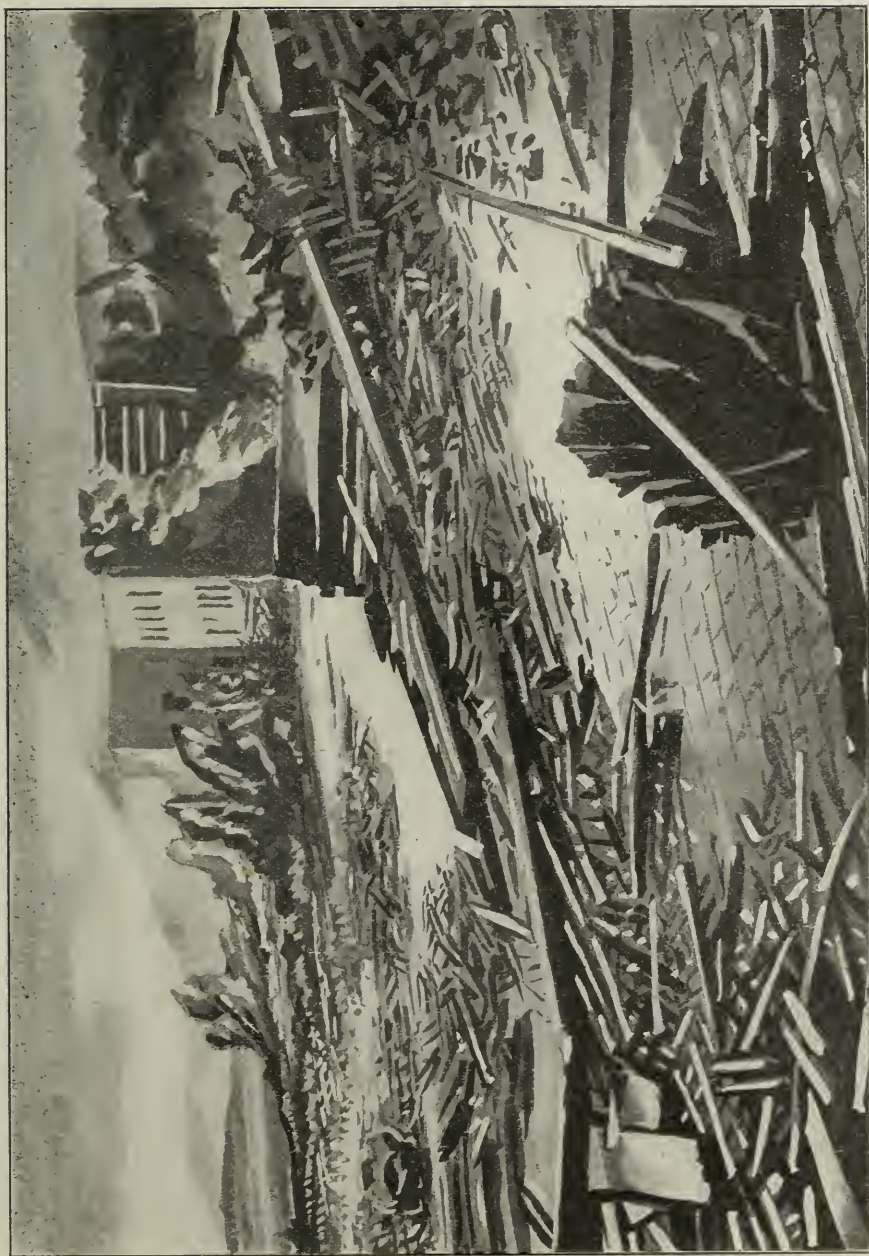
ITALY'S WOE—TERRIBLE DESTRUCTION—MORE THAN LANGUAGE CAN EXPRESS



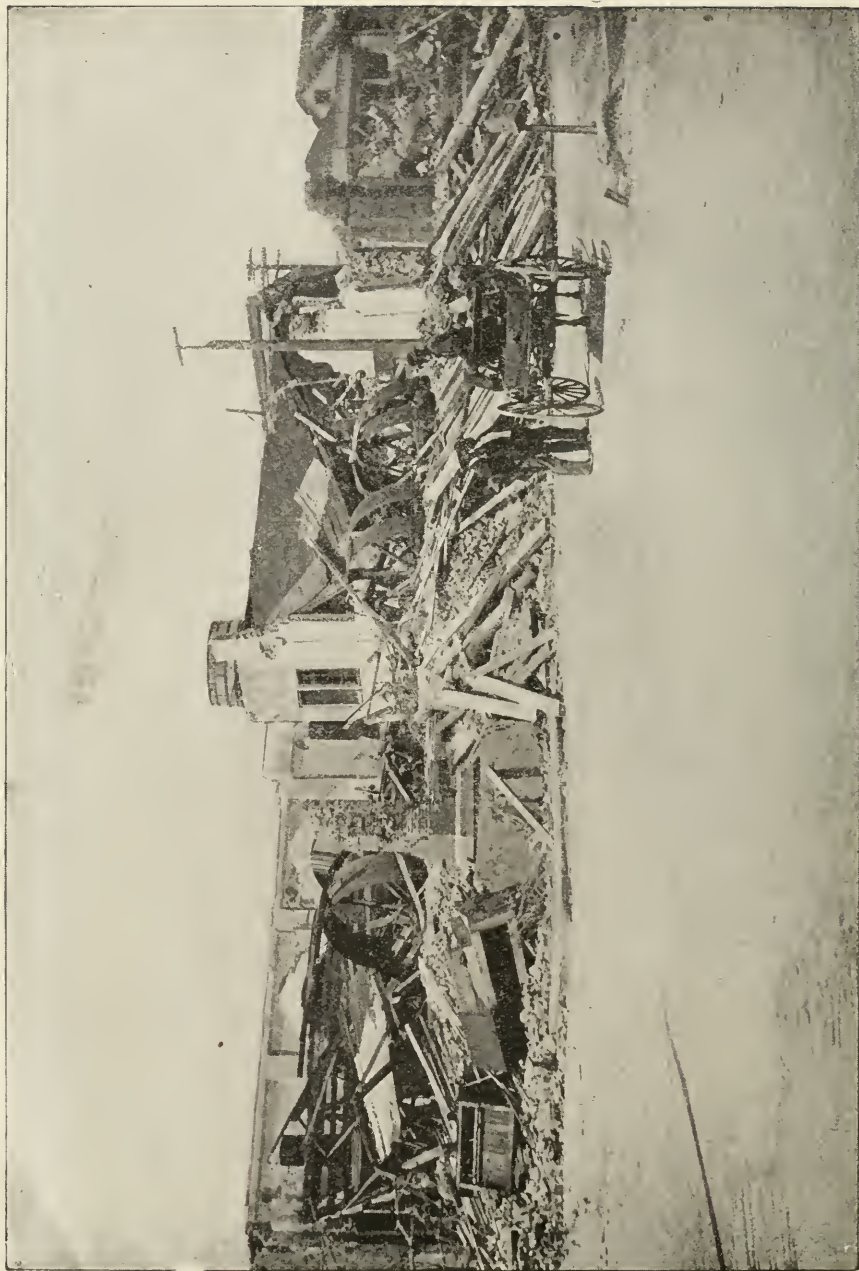
FORT NEAR MESSINA, WRECKED BY THE EARTHQUAKE



SCENE OF HORROR WHERE WHOLE FAMILIES WERE OVERWHELMED BY
EARTHQUAKE AND FIRE



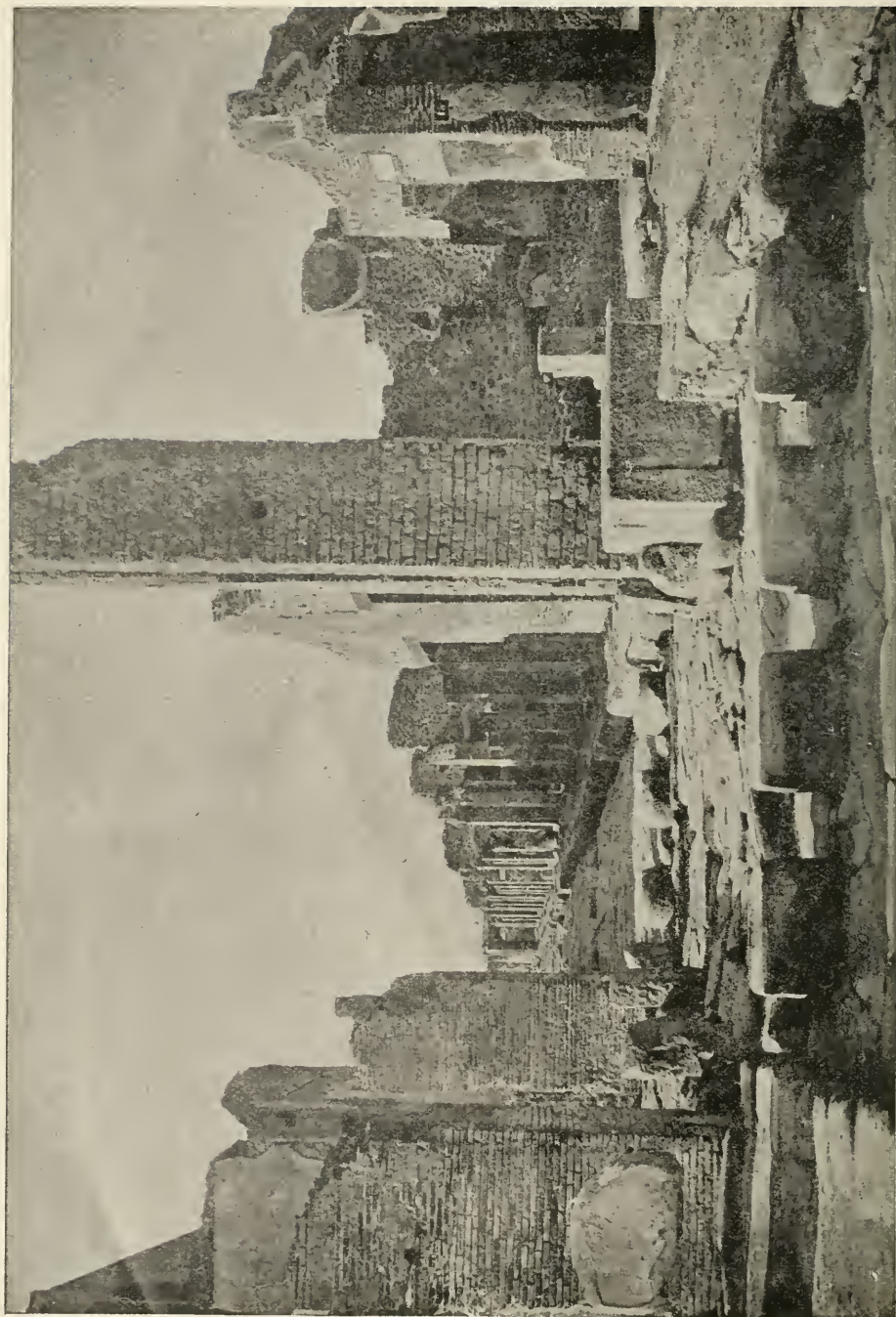
SCENE ALONG THE WATERFRONT OF MESSINA.



RUINS OF BAGNARA—SHOWING AWFUL HAVOC WROUGHT BY EARTHQUAKE



HOUSE NEAR REGGIO THROWN FROM ITS FOUNDATIONS BY THE TIDAL WAVE



SCENE IN POMPEII—SHOWING EXCAVATED STREET

ITALY'S GREAT HORROR
OF
EARTHQUAKE AND TIDAL WAVE
TERRIBLE DEVASTATION AND
HEART-RENDING SCENES
IMMENSE LOSS OF LIFE AND HUNDRED MILLIONS
OF PROPERTY DESTROYED
THE MOST APPALLING DISASTER
OF MODERN TIMES

CONTAINING
VIVID DESCRIPTIONS OF THIS OVERWHELMING CALAMITY—
SUDDENNESS OF THE BLOW—GREAT NUMBER OF
VICTIMS—FALL OF GREAT BUILDINGS—THOU-
SANDS DRIVEN FROM THEIR HOMES

THIS UNPARALLELED CATASTROPHE
LEAVES MESSINA AND OTHER BEAUTIFUL
CITIES HEAPS OF RUINS

FROM STORIES TOLD BY EYE WITNESSES

TO WHICH IS ADDED

GRAPHIC ACCOUNTS OF THE ERUPTIONS OF ETNA, VESUVIUS
AND OTHER VOLCANOES, EXPLAINING THE CAUSES
OF EARTHQUAKES, TIDAL WAVES AND
VOLCANIC ERUPTIONS

COMPILED

BY JAY HENRY MOWBRAY, Ph.D., LL.D.

The Celebrated Author Traveller and Lecturer

Embellished with a Great Number of Superb Photographic Views
showing heart-rending Scenes in this Appalling Calamity

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PREFACE.

DISASTER without parallel on the blood-stained pages of history ; almost a quarter of a million of human beings swept into eternity in scarce more than the twinkling of an eye ; thousands maimed and bruised and battered, bereft of home and family and driven to the verge of madness by their sufferings ; millions of dollars worth of property destroyed ; half a dozen cities swept away in one supreme cataclysm and scores of lesser towns and villages wiped from the face of the earth.

That is the stupendous story of the great earthquakes and tidal waves that devastated Southern Italy and Sicily in the closing days of 1908.

It is the terrible climax of a series of convulsions of nature that began six years before, when Mont Pelee with one foul breath, blotted out 40,000 lives on Martinique.

Then came San Francisco, with a property loss and suffering heretofore unequalled.

Valparaiso and Santiago, Chile, next were swept by the avenging hand of nature.

Kingston, Jamaica, was scourged till it almost ceased to exist.

Flame or tidal wave in each contributed to swell the terrible total of destruction.

But Italy's devastation was far greater than any of these, Tidal waves followed close upon the most terrific earth shocks man ever had been called upon to suffer. Flame added to the horror and pestilence stalked over the shattered ruins and took its added grim toll of death from the serried ranks of the mind-wrecked and nerve-shattered survivors of the earlier horrors.

The shaken area was almost as large as the State of Pennsylvania. Throughout this, the most historic and one of the most fertile regions of earth, one in every two of men, women and

children perished within the space of less time than it has taken to pen these lines.

Small wonder that a horror-stricken world stood aghast at Italy's agony. The human intellect could scarcely grasp the immensity and thoroughness of the horror.

After the first shock came a paralyzed lull. Then the world fairly leaped to the aid of the stricken nation.

In every civilized city on the globe money was poured out like water for the succor of the survivors. Civilization's debt to Italy was repaid a thousandfold.

The dead were past even exhumation. Buried deep beneath the debris of the homes they loved so well, their bones will crumble to the dust of the centuries. Nature was the only gravedigger countless thousands will ever know.

Messina, Reggio and their neighboring towns may rise, phoenix-like, from their ashes, but it is doubtful. Certainly centuries must elapse. City and population alike have paid their tribute to nature with their lives. It seems to-day to be a death that can know no resurrection.

Men are only now delving in the ruins of Pompeii and Herculaneum, which perished twenty centuries ago. The disaster that overwhelmed them was scarce more complete than Italy's latest devastation. The toll of human life exacted was infinitely smaller, yet they could not survive.

These modern victims of the earthquake's wrath outlived damage in the past at the hands of the all-powerful forces that are beyond and above man's guidance. Now they have suffered destruction so utter and so complete that any attempt to reconstruct them must be reconstruction indeed and repopulation as well.

The vines will still grow on Etna's sun-kissed slopes; wine and olives still will pour from the Calabrian steeps. That is true. And men will be found who will dare the dangers of this oft-scourged land in the future as their forefathers have done in the countless centuries of a horror-stained past.

But there are too few left to make more than half a dozen

villages. The remnants of the vast army of workers who thronged this human bee hive will have no companion in the shattered streets save the wraiths of those who paid the penalty of their temerity and their patriotism with their lives.

The world speaks of this stupendous disaster as Italy's. Yet it is America's in scarcely less a measure. Hardly a family in all the stricken region but had at least one breadwinner on our own side of the Atlantic.

Scarcely a home in all America which housed a family of Italian parentage but mourns for loved ones lost.

There is a lesson in all things. But that lesson can convey no rebuke to the hardy peasants who loved the land that their forefathers loved. They took the well-known risk and paid the penalty with their lives. So be it.

But if we of to-day, in a land blessed by nature and blossoming like the rose, fail to read aright the ages-old story; if we do not realize, as never before, that there is over and above us a power greater than our own, a power who holds the lightnings in His grasp and the hurricane in the hollow of His hand, the martyrs who perished on the Sicilian and Calabrian shores have died in vain.

INTRODUCTION.

EARTHQUAKE disasters have followed each other with appalling frequency throughout the centuries, and have, as in the dreadful Italian catastrophe, proved a scourge of plague proportions; yet scientists are at loggerheads over the cause of this phenomenon, and it is only within the last thirty years that the study of earthquakes has been taken up for serious investigation.

Several distinct causes are suggested for the deadly phenomena. Great concussions, even on the surface, as in the great landslide at Rossberg, Switzerland, are capable of producing powerful shocks in all directions; and where these slides are beneath the surface they are able to bring about a disaster like that of San Francisco. Again, it is believed, that sudden movements of the molten interior of the earth, against the crust may be responsible for the violent tremors.

A RECENT THEORY.

The latest theory, which is regarded as a plausible one, is the result of years of investigation by the veteran English seismologist, Professor Milne. He believes the records now at our command, showing the districts most frequented by earthquakes and the time at which they occur, correspond to the changes in the direction of the earth's pole, which is constantly shifting its position.

The reasons for the shift of the pole is put down to the movement of rock material within the liquid portions of the earth just below the crust. These same migrations of huge quantities of solid matter shift the axis of the earth; but they do more—they appear in certain places and exert enormous pressure upon those places, and create earthquakes, often with the attendant discharge

of molten matter through volcanoes adjacent to the place of the quake.

The causes for the earth-tremors—the presence of which can be noted thousands of miles from the centre of disturbance—are, therefore, still a matter of conjecture. But no such conflict of opinion exists as to the localities most afflicted. In fact, scientists have agreed that there are two great zones of earthquakes. The most important of these zones includes some 54 per cent. of all the shocks, and is outlined by the Alps and the Mediterranean (where the Italian disaster occurred), the Caucasus and the Himalayas.

The other belt surrounds the Pacific Ocean, following the line of the big mountain ranges in the western part of North and South America, and festooning the islands on the borders of Eastern Asia and Malaysia. This latter belt includes 41 per cent. of all the shocks studied, so that 95 per cent. of all recorded shocks belong to one or the other of the two great belts.

STUDIED BY JAPAN.

So ably have seismologists handled the subject of earthquakes that they have been able to deduce most interesting facts regarding their occurrence. For instance, Dr. Omori, the distinguished professor of seismology in the University of Tokyo (Japan, because it is a victim of shocks, is proving an excellent student of them), has brought out the fact that the earthquakes follow each other in these two belts in a systematic way. They do not appear as an extension of each other in the same belt; but invariably when there has been a violent tremor in one province, the next disturbance is likely to occur in a distant section in the same belt rather than a neighboring one.

It was because of this that Professor Omori, on his visit to California, after the earthquake of April 18, 1906, was able to express the view that the next great shock upon the Pacific coast of North and South America would occur in the seismic belt south of the equator. And, sure enough, before he reached Japan, came the shocks which were so disastrous to Valparaiso, in Chile.

It is true that the volcanic and seismic histories of the same province show that unusual earthquake intensity occurs at the same time as excessive volcanic activity. During the great Calabrian earthquake of September 8, 1905, the greatest for a century for that neighborhood prior to the present one, the neighboring volcano, Vesuvius, showed not the slightest sympathy. Eight months later, however, there occurred in it the greatest eruption in almost three centuries. Going back to the fearful earthquake in Calabria, in 1783, we find that both Etna and Vulcano only became active after some time. It would seem, then, that the underground changes producing earthquakes are responsible for the throwing out of masses of matter through the fissures called volcanoes.

Italy, although a heavy sufferer through earthquake and volcanic disturbances, has not been alone in frequently paying toll in lives to earth tremors. The lower valley of the Tagus, upon whose bank the city of Lisbon is built, has a long record of disastrous earthquakes, the most noteworthy of which were those of 1309, 1531 and 1755. Until the disaster at Messina the Lisbon horror of 1755 took first rank, in many respects, among all recorded earthquakes. The first shocks of this earthquake came without other warning than a deep sound resembling thunder, which appeared to proceed from beneath the ground, and it was immediately followed by a quaking which threw down almost the entire city. In six minutes sixty thousand people perished. The day was almost immediately turned into night, owing to the thickness of the dust from the shaken city and the ruins quickly took fire, so that to the destruction from the shocks were added the horrors of a conflagration and pillage by bands of robbers. The new Lisbon quay, which had been built entirely of marble, suddenly sank into the sea with an immense crowd of people, who had gathered in supposed safety upon it, and the accounts state that not one of the bodies ever floated to the surface.

Following hard upon the first shocks, the sea retired from the land, carrying boats and other craft with it, only to return in a great wave 60 feet in height, which completed the destruction in

and about the city. This great sea wave, which was, until that which recently wrought such havoc in Italy, the mightiest which has ever been described in connection with an earthquake, not only swept the coast of the Iberian Peninsula, but extended with destructive violence to the coasts of many distant countries. At Kinsale, in Ireland, it was strong enough to whirl vessels about and to pour into the market place.

The present scene of disaster, Calabria and Northeastern Sicily, has a long record of shocks; and for no other country save Japan have the records of local earthquakes been so long or so well preserved. The areas shaken have not been extraordinary for extent, but as regards both the changes in the country produced and in the loss of life which occurred they rank among the greatest in history. The shocks of 1783, which cost 30,000 lives, came without warning, and in the space of two minutes threw down numberless cities and villages. Here again there was a tidal wave, and 1600 people who sought safety on crafts were destroyed by it. The coast outline has been changed by every quake; in fact, there is no such thing as a permanent coast outline near Calabria.

The Empire of Japan is, as regards its land area, perhaps as unstable as any upon the globe, and the records of its earthquakes are probably as complete as any that are in existence. The total number of recorded destructive earthquakes in a period of nearly 1500 years is 223. Since the beginning of the seventeenth century the records prove that a destructive earthquake has occurred somewhere in the Empire once every two and a half years. The earthquake of October 28, 1891, shook an area of 243,000 square miles, or more than three-fifths of the entire area of Japan. Without the least notice the stroke fell, and in thirty seconds there followed a destruction of 7000 lives and 20,000 buildings, while 17,000 people were more or less seriously injured.

In 1897 occurred the earthquake of widest geographical extent yet recorded. It was at Assam, India, and in two minutes and a half destroyed everything within an area of 150,000 square miles, and shook with more or less violence some two million square miles.

The United States has a list of shocks, which have in several instances been very disastrous. The earthquake of 1811 along the Lower Mississippi River was felt throughout the United States, and between December of 1811 and March of 1812 not less than 1874 shocks were recorded in the Mississippi Valley. The neighborhood of New Madrid, Mo., never entirely ceased shaking, and rumblings are heard to-day.

In 1886 came the quake along the Atlantic seaboard. Before the eventful August 31, 1886, few, if any, of the inhabitants of the quiet city of Charleston, S. C., had the slightest idea that they stood in danger from earthquakes. Yet the Atlantic seaboard is a place of relatively high seismicity. In that earthquake of 1886 the casualties were few, although 14,000 chimneys were destroyed.

The California earthquake of April 18, 1906, is likely to be memorable because of the value of the property destroyed and the interest it aroused in Americans as to the danger from earthquakes in our own country. It is a fact, for instance, that New England is a province of rather high seismicity, although no earthquakes of destructive violence have been recorded. The same statement applies with almost equal force for the entire Atlantic coast from Nova Scotia to Georgia. Other districts of the nation which are especially likely to be disturbed are the Central Mississippi Valley, the valley of the St. Lawrence and large areas not as yet well determined in the Great Basin and Pacific coast regions of the Western States.

With the advent of recent self-registering instruments all others have passed out of use. The seismograph is in principle a finely suspended pendulum, usually of considerable weight, whose motion operates a series of levers, which in turn make marks on a piece of paper mounted on a revolving drum. All the complex seismograph instruments are varieties of this type. The pendulum only records earth motions, and is so balanced that its swings are not kept up except by a continuation of the earth tremors, whereas an ordinary pendulum would keep on oscillating if started.

Seismographs are housed in cellars, and if used to record delicate, distant shocks are brought in contact with the rock under-

GREAT EARTHQUAKE DISASTERS OF HISTORY.

B. C. 464—Laconia shaken and Sparta ruined; more than 20,000 persons killed.

A. D. 19—Syria devastated; 120,000 persons killed.

157—Pontius and Macedonia, Asia; a great number of cities laid in ruins and uncounted lives lost.

742—Syria, Palestine and Western Asia; many towns destroyed and loss of life recorded as "incalculable."

936—Constantinople destroyed and Greece shaken, with enormous loss of life.

1137—Cantania, Sicily, destroyed; 1500 killed.

1169—Cantania shaken; its cathedral destroyed; thousands killed.

1268—Cilicia, Asia Minor; 60,000 killed.

1456—Naples and vicinity; 40,000 killed.

1531—February 26, Lisbon; 30,000 killed.

1626—July 30, Naples; 70,000 killed.

1667—Schamaki; 80,000 killed.

1692—June 7, Port Royal, Jamaica, 3000 killed and the city laid in ruins.

1693—September, Sicily, 100,000 killed.

1703—February 2, Tokio, Japan; 200,000 killed.

1706—November 3, Abruzzi, Italy, 5000 killed.

1716—Algeria, 20,000 killed.

1726—September 1, Palermo, Italy; 6000 killed.

1731—November 30, Pekin, China; 100,000 killed.

1746—October 28, Lima, and Callao; Lima reduced to ruins with only 21 of 3000 houses left standing; comparatively small loss of life, 1141 of a population of 50,000 having been killed.

1751—May 24, Concepcion, Chile, destroyed; 10,000 killed.

1754—Cairo, Egypt; 40,000 killed.

1755—November 1, "The Great Lisbon Earthquake," cost 20,000 lives and engulfed city; subject of a notable description by Grace Aguilar, in her novel, "The Escape."

1759—October 30, Syria; 20,000 killed.

1773—June 7, Santiago, Guatemala, engulfed.

1783—February 5, Messina; 60,000 killed.

1797—Santa Fe and throughout Central America; 40,000 killed.

1812—March 26, Caracas, Venezuela; 12,000 killed.

1819—June 16, Cutch, India; 20,000 killed; contour of vast territory changed.

1822—August 10, Aleppo; 20,000 killed.

1822—November 19, West Coast of Chile; 10,000 killed.

1835—February 20, Concepcion, Chile; partly destroyed; 5000 killed.

1851—August 14, Milfi, Italy; 14,000 killed.

1852—September 16, Manila, Philippine Islands; partly destroyed with great loss of life.

1855—Tokio partly destroyed; 10,000 killed.

1857—December 16, Calabria, Italy; 10,000 killed.

1859—March 22, Quito Ecuador; 5000 killed.

1860—March 20, Mendoza, S. A., 7000 killed.

1863—July 2, Manila, Philippines; 1000 killed.

1863—August 15, Peru and Ecuador; series known as the "Great South American Earthquakes," which followed hurricanes, earth tremors, and volcanic eruptions, ending in tremendous shocks of August 13 to 16 and occasioning vast tidal waves, causing 25,000 deaths and enormous damage to property.

1875—May 15, Columbia, South America; 14,000 killed.

1881—April 3, Scio, Italy; 4,000 killed.

1883—August 26, Krakatoa, volcanic island in Sunda Straits; 50,000 killed.

1883—October 16, Anatolia Asia, and many surrounding towns destroyed.

1885—July 8, Cashmere; 20,000 killed.

1886—August 31, Charleston, S. C., and the South Atlantic Coast; 98 killed; property loss, \$8,000,000.

1887—February 24, Switzerland, France and Northern Italy; 2000 killed.

1888—March, Yun Nan, China; 4000 killed.

1888—Japan, Province of Tushima, 165 miles north from Tokio; 600 killed.

1891—October 28, severe shocks in Mino and Owari Provinces, Japan; 7000 killed; 200,000 houses destroyed.

1897—June 12, Assam, India; 1,750,000 square miles shaken; believed the greatest that ever happened.

1902—May 8, Martinique, eruption of Mount Pelee follows quake; Saint Pierre destroyed; 40,000 killed.

1905—Southern Italy; 600 killed.

1906—April 18, San Francisco; city damaged by quake and in large part destroyed by fire.

1906—August 16, Valparaiso, Chile; 1000 killed; 100,000 rendered homeless.

1907—January 14, Kingston; 1200 killed.

1908—Earthquake and tidal wave in Italy.

CHAPTER I.

THE HORRORS OF THE EARTHQUAKE AT MESSINA.—CITY SLEEPING WHEN DISASTER CAME.—CRUSHED IN FALLING HOMES.—DRAMATIC SCENES.—THE TIDAL WAVE.

THE hour was early dawn. Messina, the centre of the greatest disaster of historic times, lay sleeping on that fatal 28th day of December, 1908.

That faint chill which comes to the semi-tropic lands in the waning hours of a mid-winter's night was in the lazy air.

The Mediterranean lay like a sea of glass beyond the breakwater. The faint breath of breeze that crept over its waters from the northwest was scarcely sufficient to ruffle its placid surface.

Etna's lava-scored but vine-clad slopes darkened the southern horizon, while from its snow-capped peak, reared 10,000 feet into the heavens, a thin wisp of smoke, gilded by the eternal fires in the death-dealing crater below, floated idly off to the southeast.

The hour was dawn, but not a ray of light came from the heavens to banish the foreboding pall that hung like a sable shroud over the doomed city.

The wide streets, with their myriad of gleaming lights, were deserted save as here and there a belated straggler, muffled to keep out the unwonted chill, hurried to the early mass in some one of the city's majestic churches.

In the capacious harbor scores of vessels swung idly at anchor.

The silence was unbroken save for the muffled tread of the sentries on the ramparts of the citadel and the lesser fortresses that dotted the water front.

The city slept.

In massive palaces and humble hovels alike men, women and children lay wrapped in a slumber from which they were so soon to start in terror only to be plunged anew into that sleep that knows no waking.

Tired and worn in body and mind alike by the holiday revels they

dreamed on. No foreboding of their impending doom cast its dread shadow over their couches.

All nature seemed at rest and at peace.

Suddenly out of the skies came a sinister hiss that caused the very priests at the altar to halt in their sacred offices. Heads bowed in prayer were raised as the hiss deepened into an unearthly shriek. The kneeling worshippers leaped to their feet for one brief instant and then slowly and reverently, but with an added touch of terror, again sank to their knees and began to feverishly finger their beads.

Crash! Bang!

The heavens thundered as from the bursting of ten thousand bombs.

The hiss deepened till it seemed that a myriad of red hot serpents were writhing in the waters.

Then came the whirl, the rush and roar of a torrential rain so terrifying that not a face but blanched with apprehension. Only those who have faced an electrical storm in the tropics can imagine one hundredth part of the horror of that supernatural demonstration.

THE EARTH BEGINS TO QUIVER.

The earth began to pulsate. Slowly and in rhythmic measure at first as though trying its strength and then with a wild and frenzied burst like the dance of a million imps. It rocked not only Messina, but half of Sicily and all of Calabria like a raft in a storm.

It lasted but an instant, but in that brief span scores of thousands perished 'neath the ruins of the stricken city.

The first crash from the heavens reached every ear in Messina.

The houses had begun to vomit terror-stricken men, women and children before even the fantastic dance of earth began.

Full well did those who dwelt in the shadow of majestic but death-dealing Etna know what the artillery of the heavens portended.

Science may present its theories. Those who dwell in the shadow of death have no use for them.

Ages of calamity had taught those men of Messina that earth and heavens act in harmony and that the rattle of the thunder and the roar

of the tempest was but a prelude to a drama of death in which the very earth beneath their feet was to sway like the waves of the sea.

Thousands gained the open streets before the final crash came. Walls fell to the right of them; roofs crashed to the left of them; cornices and chimneys toppled before them, while death stalked in their wake to destroy any who hesitated or paused. Other countless thousands were too late or were held prisoners of jammed doors and fallen stairways.

The earth shook itself in one great convulsive movement as though the giant whom tradition says Jupiter ages ago imprisoned beneath the massive rocks of Etna was struggling, after centuries of confinement, to break his bonds.

DEATH WROUGHT BY DISASTER.

Walls shivered, gaped and fell, carrying down to death all who still clung, with convulsive fear, to their racked and ruined homes.

Beams groaned and creaked, as if in mortal agony, and then at the final and supreme moment, slipped from their sockets in the walls. Roofs crashed to earth, carrying down with them the massive arched floors beneath.

Even all of those who had sought safety in the streets did not escape. In many of the narrower thoroughfares the debris piled many feet deep from curb to curb, burying under countless tons of stone and mortar not only those who in their terror had taken shelter in their shadows, but the fleeing hordes who, maddened by the terror of that awful moment, had sought safety in flight.

Still other walls, relieved of the burden of roofs and floors, hung tottering, seamed and scarred by the terrible forces of the cataclysm.

Crash!

The very heavens seemed appalled and the low-hanging clouds reflected back the sound.

"Dies Irae," the day of wrath, screamed a thousand throats.

The great gas tanks, at the northern end of the town had blown up, and before the force of that terrific explosion the tottering and hesitating masonry crashed prostrate to the dust, burying hundreds of al-

ready cut, bruised and battered human beings in the only tomb most of them will ever know.

In this crash the Capucine Convent fell, while hundreds perished.

Within the churches was to be found the nearest approach to serenity in all that stricken city. The black-frocked priests hesitated but a moment, and then, grasping the sacred hosts in their hands, slowly and with even more than usual reverence resumed their chants till the loosened beams and seamed and gaping walls let tons of death and destruction down upon the flaming altars, burying priests and people alike in the depths of a funeral pyre.

The gas lamps flared for the brief instant of the explosion like the last dying flicker of a candle. Then they went out, leaving the streets in utter darkness.

In the horrible wrenching and grinding and twisting of the earth the electric wires broke, and a million hissing serpents, spitting death, coiled about the panic-stricken survivors.

Again the ground trembled and the earth yawned in hideous fissures that seamed the streets like giant mouths, hungry to devour the panic-stricken and the helpless.

WATER MAINS GUSH FORTH DEATH.

The water mains parted and the reservoirs gushed forth death and devastation.

Meanwhile the cold rain from the north, driven by a wind that had risen to the heights of a hurricane, mercilessly beat upon the helpless and hopeless survivors.

Yet, blindly groping in the almost Stygian blackness to which the dust clouds from the fallen buildings gave added depth, the scarred and stricken survivors plunged on to the open spaces where they felt that safety lay.

In the mad panic few stopped to consider direction save as it carried them to the broad esplanade that lined the harbor, and away from the Etna of which centuries of peril had ingrained fear into their very beings.

Climbing over seemingly impassable barriers of broken stone and

The Trinacria and the Victoria hotels, with their hosts of tourists of all nations, crashed into mounds of ruins over what were in grim truth the graves of hundreds.

The Theatre Victor Emanuele and the Theatre della Munizione, two structures of the highest class, were scarred and battered, their roofs fallen in and heaps of mortar defiling the plush and brocade where, but a few hours before, grace and youth and beauty had smiled away their last happy hours.

NOBLE STRUCTURE DESTROYED.

The massive antique columns of the Church of the Annunziata dei Catalani, another grand old Norman structure, tottered and fell, crushed and broken, while the entire facade of the noble structure, wavering for a brief instant, swelled the mass of shapeless fragments.

The American Consulate, too, fell at the first great shock, burying the Consul, Arthur S. Cheney, and his wife. Another American who was killed was Joseph H. Peirce, former U. S. Vice-Consul, who with his family were crushed to death.

The entire family was asleep when the first shock came, according to the rictal of Miss Evelyn Peirce, a cousin of Mr. Peirce, who was safe at Naples. Mr. Peirce was the first one to realize the terrible shaking as an earthquake. He urged his wife to take the younger children and make her escape. He then rushed into the room where the elder children were sleeping to arouse them, but the tidal wave rushed in and completed the work of destruction. The tottering walls of the Peirce house collapsed and the entire family was buried beneath the ruins.

Mr. Peirce was the Messina correspondent of the Associated Press.

Among the buildings wrecked was the barracks of the carabinieri, in which 50 perished in the ruins.

A palace of 26 rooms collapsed and of the inmates only four escaped.

The seaward fronts of the University and Palazzo Municipale remain standing, but the interiors are gone. The buildings along the waterside collapsed like houses of cards.

The Santelia barracks were destroyed with most of the troops in them, only thirty soldiers escaping out of 230.

In the growing brightness of the dawn they saw what yet was hidden from those lower down along the water's edge.

Rearing its head fifty feet in the air a giant wave was racing from the Calabrian shore. They did not know, could not know, that already this same wave, first sweeping to the eastward, had engulfed Reggio di Calabria, a city of 50,000 people, eight miles to the southeast on the Italian mainland, across the Straits of Messina and that rebounding from the Calabrian cliffs it was returning to wreak a further vengeance on stricken Messina.

Those to the north, beyond the end of the breakwater, saw it almost as soon as the survivors in the forts.

In an instant there was a wild rush for safety, back across those hideous piles of ruins, while the groans of the injured, hopelessly pinioned beneath beam and brick, added to the horror.

None then thought of succoring the injured. Self-preservation is nature's first law and self-preservation was possible only by flight.

It seemed but a moment before the hissing wave, speeding along with the fleetness of a race-horse was upon them.

BATTLING IN THE VORTEX OF THE TIDAL WAVE.

Men, women and children again had a battle with the most diabolical forces of nature for their very lives.

The wave, 50 feet high, rolled back three blocks from the shore line and in its waters thousands met that death they had so miraculously escaped in the vortex of falling walls and crashing masonry.

Hundreds of half-dressed men, women and children who had fled from their houses to the streets were caught in the onrush of waters and drowned or injured.

In a moment it had receded, carrying with it many of its unhappy victims, while the bodies of hundreds of others strewed the strand.

Flames then began making their way slowly over the devastated area in an inexorable advance. Imprisoned and pinioned human beings, unable to extricate themselves, burned alive, hundreds were dying of their injuries, while many were starving.

The streets were filled with confused masses of brick and mortar,

CHAPTER II.

FIGHTING FOR FOOD IN THE RUINS.—FAMISHED BAND GROPE IN DEBRIS.—GHOULS FIGHT WITH FIREARMS.—SCOURGE YET TO COME.—VANDALISM BREAKS OUT.

JUST as the British steamship Ebro was preparing to leave Messina with refugees an outburst of frightful cries was heard from the shore. The refugees on board saw a crowd of maddened persons of every age break into the custom house. Some were naked, others half clothed, and they all were mudspattered and half demented. Many were injured and bleeding. They sacked everything that came to their hands, seeking food, drink and clothing.

Bands of famished individuals were groping among the debris in the hope of discovering food. The first of the searchers who were successful were attacked by others with revolvers and knives, and were obliged to defend their finds literally with their lives.

The struggle was fierce. The famished men threw themselves upon each other like wolves, and several fell disembowled in defending a handful of dry beans or a few ounces of flour. One of the unfortunates was pinned to a plank with a knife, while clinging to his hand was a little child, for whom he had sought food.

Revolver shots rang out over the horrible din and confusion. Finally tongues of flame shot up in the darkness, showing that fire was completing the work of destruction.

This was only one of the many scenes of horror witnessed from the Ebro. Messina was burning, and masses of flames in the darkness showed where fire was completing the destructive beginnings of the earthquake. A few skeleton houses here and there were all that remained of the once beautiful and prosperous town.

Ghoul-like figures flittered in the semi-darkness, risking their lives among tottering ruins, not to assist the agonized sufferers, but in fiendish strivings to profit by the appalling disaster. They were robbing the dead and dying.

All of the survivors speak of the misery suffered by cold and hunger after their escape, and of the rarity of other survivors seen in the streets and open places, so that often they believed themselves to be the only persons saved; and of the dense, choking cloud of dust which hung over the city for a long time, obscuring their vision and adding to the horrors of their bewilderment; and of the greater horrors of the succeeding earthquake shocks, especially in the darkness, which seemed to forbid all hope of final escape. The worst time of all was the night of Monday. Few of them mention the effect of the seismic wave.

IMPRISONED IN RUINED HOME.

Perhaps the most tragic note was struck by an elderly couple, who described how they were imprisoned in the lower part of their ruined house. They could only cry for help and heard no answer, save other cries for help from the darkness around them.

At Messina it was impossible to pass through most of the streets, which were blocked with huge mounds of fallen debris. Here and there bodies, they said, could be seen in inaccessible places, pinned in by beams on masonry and projecting from the upper stories of the houses, sometimes lying half buried and horribly contorted.

In front of the city the sea wall was broken up and fallen and the sea walk was sunk under water. Behind this were streets upon streets of fallen houses. In some places the appalling scenes seem to beggar all description.

The correspondent of the Paris Figaro wired his paper about this time as follows:

"As each day goes by the disaster appears more horrible, terrifying and immense. It is without precedent in the history of the world. In my earlier dispatches I spoke of over 150,000 dead. This number doubtless will be exceeded, for now it is conservatively estimated that 200,000 persons perished miserably in this staggering catastrophe, and the worst is not yet known. The scourge has not yet done its final work.

"The tremblings of the earth continue with sinister rumblings, and at times jets of boiling water surge from the crevasses. The sources of the streams are poisoned with putrid matter.

They saw the crash from a distance not too great for accuracy, yet still enough removed to lend an added touch to their words.

Among the first calm and collected stories of the disaster as viewed from the deck of a vessel in the harbor came from the master of the Welsh steamer *Afonwen*, whose unemotional British temperament enabled him to relate in detail his experiences and observations.

A TRAGIC RECITAL.

"During the night before the catastrophe," said the captain of the *Afonwen*, "we lay at anchor in the harbor of Messina under steam ready to leave early the following day. It may have been about 5 o'clock in the morning when I heard a low growling sound like distant thunder. Daylight had not yet dawned, but I was on deck and the crew were stirring. The peculiar sound made me glance anxiously at the sky and then at the sleeping town of Messina, neither of which afforded any explanation.

"Suddenly the *Afonwen* gave a terrific leap. That is the only word I can use. The ship seemed to rise up from the surface of the water as though lifted bodily by some mighty power underneath. The anchor chains snapped and we started to drift shoreward very fast.

"From the land came sounds of tremendous crashing and falling of buildings. The low, muttering thunder which I first heard now became a roar of destruction. All the lights along shore went out in an instant. The darkness was intense.

"Instinctively I knew this was an earthquake and that tidal waves were dashing us about the Straits. The first thing to do was to save the ship, for other craft were being thrown about on all sides and there was imminent danger of collisions. Another boat swept down upon us before I could get the crew to their stations and the *Afonwen* under control, but luckily the bump was slight and not much damage was done."

"Now the sea became tremendously agitated with waves and walls of water rising on every side. The ship listed to her beam ends. The deck heeled over to an angle of 25 degrees, so that we scarcely could keep our feet. For thirty-five minutes it was touch and go. Once a great

wall of water struck us with such violence that I thought all was over, but by a miracle we came through it.

"It was like a cyclone from all points of the compass. The wind howled and the waves battered and swept the decks. Amazing and terrifying things were happening all around us. Great holes opened in the sea itself and seemed to reach down twenty to thirty feet, and some at lesser depths.

"The water at first appeared to grow livid and then became white with foam.

"As soon as the worst of the tidal wave had passed I tried to see what had befallen the town of Messina as the first faint streaks of daylight appeared, but nothing was visible of mole or buildings. I could see at first only the outline of the hills and a vast eddying cloud of dust which speedily enveloped everything and settled down over the ship like a fog.

MESSINA'S BUILDINGS TOPPLE.

"With increasing daylight we could see how Messina had been destroyed. Before our eyes houses and palaces still were toppling and falling to earth with noise like so many exploding powder magazines. Close behind us a Danish steamer had gone down and the surface of the water was littered with all manner of wreckage from it and other wrecked craft.

"When we looked at the land again it seemed to have taken on some fantastic coloring—something between a yellow tint and an ashen gray. The city itself was black with smoke split by ominous red streaks of bursting flame. Gradually the sea calmed down and the roar of wind and waves decreased.

"Then shrieks and groans reached our ears, and we could see hundreds of terror-stricken persons flocking down to the water's edge, waving their arms and screaming frantically for help. Many of them plunged into the sea and swam out toward our ship. We took on board as many as could be accommodated."

At the time of the earthquake the torpedo boat Sappho was lying in the harbor at Messina, and one of the officers told of the occurrences as follows:

"At 5.30 in the morning the sea suddenly became terribly agitated, seeming literally to pick up our boat and shake it. Other craft were similarly treated and the ships looked like bits of cork bobbing about in a tempest.

"Almost immediately a tidal wave, of huge proportions, swept across the Straits, mounting the coasts and carrying everything before it. Scores of ships were damaged, and the Hungarian mail boat Andrassy parted her anchors and went crashing into other vessels. Messina Bay was wiped out and the sea was soon covered with masses of wreckage, which was carried off in the arms of the receding waters."

The later stories of ships' officers also depict the terrors of the scene with startling vividness.

LITTLE CHANGE IN STRAIT.

The commander of the Russian cruiser Admiral Makaroff, after it had arrived at Naples with refugees from Messina, gave the following account of the disaster :

"Hearing at Agoata, Sicily, of the disaster, I hurried to Messina. The city was literally nothing but a heap of ruins. Every building collapsed, but in many cases the outward shells remained standing and as a result the general contour of the city was less changed than might be expected.

"This is particularly true of the sea front. In spite of what has been said, the form of the Straits of Messina show little if any change.

"The harbor is filled with refuse of every kind, and at one end lies the wreck of a sunken steamship.

"It is impossible to give even a faint idea of the desolation of the scene. Every now and then we heard the crash of falling floors and walls. This constituted the greatest danger to the rescuers. It was not safe to approach any standing masonry. Men from my vessel had many narrow escapes, and I saw several terrible accidents to the brave Italian soldiers, who were doing more than their duty.

"We lost no time in setting about the work of rescue. We established an open-air hospital on the shore, where we received and treated

1,000 men, women and children. We also saved the safe of the Bank of Sicily with its treasure, weighing two tons.

"The mind shrinks from contemplation of the present condition in the stricken city; that there are thousands of persons still alive in the ruins, and that countless numbers must die.

"The tidal wave lasted much longer than the earthquake. During all the time we were in the harbor of Messina our vessel shivered intermittently, as though shaken by some huge marine monster.

"I could relate pathetic stories without number. Under some wreckage, inclosed in a kind of little cubby-hole and protected by two heavy beams, I discovered two little babies, safe and uninjured. They were comfortable as possible, and laughing and playing with the buttons on their clothes. We could find no trace of their parents, who undoubtedly lost their lives. It made a terrible impression to see the bereaved children.

NO JOY IN HEARTS OF SURVIVORS.

"Many little ones live while their parents are dead, and we saw many mothers with dead babies in their arms. It was also indescribably painful to see the many who had gone crazy from grief. They searched and searched aimlessly for their loved ones, keeping up the quest even after they had been brought on board our ship."

The Serapin also brought to the outer world stories of heartrending separation of families and the hopeless and frantic seeking of relatives one for the other. Just as the steamship was leaving Messina a man made his way to the dock and called again and again for his wife and children. The people on board listened attentively. Then from the vessel came an answer: "I am here, I am here," in a woman's voice. "Are the children there?" came from the dock. "Yes, we are all here," the woman replied. But there was no note of joy from the unfortunate mother. Her heart could hold no happiness after the experiences of the night.

Shortly after the Serapin docked at Naples a gangplank was lowered and a few persons were allowed to board. The refugees were found sitting in isolated groups. They gave evidence of great mental depres-

CHAPTER III.

FROM THE LIPS OF SURVIVORS.—HIS BED BESIDE AN ABYSS.—FACING
ALMOST CERTAIN DEATH.—WOMAN SAWED FREE.—CUT FINGERS
FROM DEAD.—BURIED 30 FEET DEEP.

CONSTANTINE DORESA, a London ship broker, had a wonderful escape from the Trinacria Hotel. He tells a thrilling story of the earthquake disaster. He says:

"It was a dark, still night, the coldest I ever felt in Sicily. I went to bed late, after putting extra covering on the bed. I was awakened without warning at 5.25 o'clock. The bed first rose up and then rocked violently. I clutched the sides of the bed, which seemed to be falling through space of ages.

"Afterwards I estimated the time to be ten seconds. Then came a series of awful crashes, the roof falling all round me. I was smothered in brick and plaster. I knew it was an earthquake. I had been in one before in Athens. Then followed terrific crashes, mingled with a continuous roar.

"I felt for matches, struck a light and was horrified to find my bed on the side of an abyss."

Doresa discovered Craiger, an English friend, and from the ruins rescued a Swede and his wife. Amid the appalling surroundings they succeeded in reaching the quay and getting aboard the Cardiff steamer *Afonwen*. Doresa then organized a rescue party composed of the *Afonwen*'s master, Captain Owen, three of his sailors and several Russian sailors. With Doresa and Craiger all returned to the Hotel Trinacria with ladders and ropes.

En route on the balcony of a ruined building two little children were crying for help. The building seemed ready to collapse at any moment. Second Mate Read, of the *Afonwen*, did not hesitate. The children were directed to lower a string with a stone tied to it. They understood, and pretty soon a piece of stone was coming down.

Meantime Read placed a ladder against a lower balcony. Then he

turned to one of his seamen, who was standing by, and said: "Now then, Smith." Doresa adds:

"I shuddered. It seemed like certain death. Smith turned his quid in his mouth, and without a word went up the ladder to the first balcony. Then, to the string which had been let down by the children, he attached a light line, which the children hauled up and placed around one of the standards at the top of the balcony.

REACHED BALCONY BY ROPE.

"By this means Smith hauled up a 2½-inch manila rope. He then took off his boots and in a trice was shinning up the rope beside the crazy ruin. I held my breath. I have read of many brave deeds, but I never heard of one braver than Smith's. When he reached the top of the balcony he leaned over and shouted: 'Why, there's a ton of them up here. I can't manage all of them myself.'

"Captain Owen turned to Read. It was enough. In a second Read was shinning up the rope hand over hand. We watched him with fear clutching our hearts.

"There was a sigh of relief when we saw him standing beside Smith at the top of the building, which seemed to be rocking to its fall every second. The men aloft soon got to work.

"One of Captain Owen's apprentices rendered great assistance. I stood at the foot of the ladder to prevent its slipping. The moments were flying. We did not know how soon the whole thing would collapse."

"An Italian workman stood staring at us. I begged him to lend a hand, but his face only assumed a more vacant expression, if that were possible, and we were left to do the work ourselves.

"Read and Smith made their hawsers fast. Then, one by one, they lowered the cowering creatures who had been awaiting death. From that crazy height the rope was lowered ten times, each time with a child resting in a slip noose the sailors had formed.

"Then came an old woman, who was very stout. We had a great deal of trouble to get her down, but managed it at last. There was one

man among the crowd of survivors. Smith threatened to throw him off the building unless he helped to lower the woman.

"At last the brave rescuers came down on the rope themselves. They had saved twelve people from certain death. They worked as coolly as if they had been on the ground. They had been in imminent danger of their lives, yet when they came down they quite resented our congratulations.

WOMAN SAWED FREE.

"There was other work for us nearby. We heard cries from a woman buried to the waist in the ruins of a shop. The buildings round her were blazing. Slowly but surely the cruel flames were creeping nearer to her. Could she be saved? Captain Owen's sharp command sent Read rushing to the Blake, a ship moored at the quay. In a few minutes he was back with a saw. He dashed through the flames and began with frantic energy to saw through the plank that held the woman fast. We waited in terrible suspense.

"Then, with relief, we saw the end of the plank fall away and Read came through the flames bearing the rescued woman in his arms.

"Just then an officer came up and asked to what ship these men belonged, and said he would send an account of their splendid bravery to his government, and hoped they would recognize it.

"'Meantime,' he added, 'I can only thank the men for their heroic efforts.' At this moment we heard cries from back of the Hotel Trinacria, which had been left standing. We saw Signor Cogi on a narrow ledge and rescued him.

"After rescuing others the party returned to the Afonwen, loaded a boat with food and returned to the shore to distribute it. Captain Owen left me in charge of the boat while he carried out the distribution. While I was guarding it five Italian soldiers came up and tried to seize it in order to escape to the mainland. I knew it was our only hope, so I threatened to shoot the first man who touched it. They made off.

"There were from twenty to thirty shocks during the day. Prowling among the ruins were panic-stricken fugitives and escaped prisoners, the latter looting. I saw wretches hacking off the fingers of the dead to get

"Tuesday afternoon we left on the *Afonwen* for Naples. It has been said that navigation of the Strait of Messina has been rendered unsafe. I should like to correct that statement. I saw several vessels go through Monday night.

"There is no doubt vast changes have been brought about in the bed of the strait. The *Afonwen* was lying at anchor in forty-five fathoms of water. When she weighed anchor Captain Owen found there were only thirty fathoms. As to the residents of Messina, I cannot say they did much to help. They seemed to be completely panic-stricken, but their need is great and their distress appalling. Having escaped death myself I can speak feelingly for the helpless residents of Messina."

LIKE THE BURSTING OF BOMBS.

A young doctor named Rossi gave a vivid account of his experiences. His escape was miraculous, and by his calmness and energy he was able to rescue others from imminent death. The doctor was preparing to leave Messina by an early train Monday morning, the day of the disaster.

"Suddenly the profound silence was broken by an extraordinary noise like the bursting of a thousand bombs," he says. "This was followed by a rushing and torrential rain. Then I heard a sinister whistling sound that I can liken to a thousand red hot irons hissing in water. Suddenly there came violent rhythmic movements of the earth, and the crashing down of nearby walls made me realize the awful fact of the earthquake. Falling glass, bursting roofs and a thick cloud of dust added to the horror of the situation, while the extraordinary double movement, rising and falling at the same time, crumbled walls and imperiled my life.

"I rushed into the room where were my mother and sister and with a rope which, fortunately, I had with me, I succeeded in rescuing them. I was also successful in getting out of the house a number of other persons who had given themselves up for lost. Then some soldiers came and helped me, and together we dragged forth several women and children from the tottering walls of a half-destroyed palace nearby. A few seconds later this building was entirely demolished.

CHAPTER IV.

GROUND SPLIT UP EVERYWHERE.—RESCUED HIS RELATIVES.—OLD MAN'S CHARITY.—BOAT IN QUEER FRANKS.—IMPRISONED FOR FOUR DAYS.—ACTRESS SAVES SOLDIER.—LONG CRY OF ANGUISH.

ACHILLE CARRARA, agent of the General Steam Navigation Company in Messina, gives the following account of his experiences, which throws some new light on the circumstances of the disaster:

"Frantic with terror I shouted for my wife, my children and my servants, and assembled them under the arch of the window. The house rocked, but it remained erect. We dressed in darkness and blinding dust, while everything heaved about us. We staggered down the reeling staircase to the street.

"The street was choked with the ruins of the surrounding buildings, and masonry was falling. The injured were shrieking from their tombs beneath the wreckage, and the ground was split up everywhere. Horror was piled on horror, and inky blackness pressed upon us with here and there a flame shooting out from among the wreckage.

"At daylight we found our way to the harbor, where the tidal wave had thrown the water 14 feet above the quay and broken every vessel adrift. The harbor was full of wreckage, casks and capsized skiffs. Four steamers, which had been flung on the quay, had been refloated as the great wave receded, and were hanging by their anchors. They were the *Elro*, *Drake*, *Varez* and another. We hailed the *Drake*, and were taken aboard and well attended to.

"Later the captain of the *Drake* sent a party with me to rescue my relatives, who lived in the north end of Messina.

"The British consulate was found to be a mere dust heap. I located what had been my brother's house, and after digging for hours with our hands succeeded in breaking our way through the fallen masonry, rafters and broken furniture. We rescued my brother, his wife and child and 18 other persons. We found no trace of my father, mother, grand-

anguish seemed to rise from the city, then there was comparative silence for a short while.

The worst shocks were over by 6 o'clock.

Vidala made his way to his home, and found his family under the ruins. As he was telling his tale a wild-looking individual, in strange clothing, came up to the correspondent and the newspaper proprietor.

"I also am bereft of all my family," he interrupted. "I now am alone in the world like you, Vidala." It was evident that this man was half crazy. He had saved a daughter from the ruins, but his two sisters had been killed. Later he died of his injuries.

Signor Serao, owner of the house in Messina where English Consul Ogston resided, escaped. The part of the house where Serao lived did not fall. He rushed out after the first shock, and met Stuart K. Lupton, the American Vice-Consul, in the street. Signor Serao says:

"It is impossible for the wildest imagination to picture anything more terrific than the destruction of Messina. Climbing over broken beams, shattered walls and broken furniture, we finally reached the spot where the American Consulate had stood.

"The Consular building was about three stories high. It had entirely collapsed. We could hardly believe our eyes. Mr. Lupton climbed over the ruins calling out 'Cheney! Cheney!' Confident that the Consul would answer him, he said to me:

"'Daylight has not come yet and that is why I cannot see him, but he must be somewhere in the wreckage.'

FRANTIC SEARCH FOR THE CHENEYS.

"Our search became more and more feverish, but as time wore on and it was still unsuccessful we finally realized its hopelessness. We saw it would be impossible to reach even the bodies of the unfortunate Cheneys. In addition to the collapse of the Consulate a neighboring building had been precipitated upon the Consular ruins and the whole was a vast mass of wreckage.

"Touched by Mr. Lupton's despair I tried to console him, saying that undoubtedly the Cheneys had been vouchsafed the mercy to die

CHAPTER V.

EYE-WITNESSES TELL OF HORRORS.—SLEEPING WHEN CRASH CAME.—
SOLDIER'S MIRACULOUS ESCAPE.—PUBLIC BUILDINGS GONE.—
LOOTERS SHOT DEAD.

MME. KARALECH, a Hungarian prima donna, who was in Messina at the time of the earthquake, gives this account of her thrilling escape from a horrible fate:

"I had appeared at the opera the night before in 'Aida,' and had returned to Hotel Trinacria, retiring to rest at 2.30, but could not sleep. As I was lying awake I suddenly felt the hotel rock and collapse.

"I leaped from a window, breaking both arms in the fall. Despite the pain, which I scarcely felt, I picked myself up and started running toward the shore.

"I was joined by a number of other frightened refugees, all staggering blindly on, uttering cries and lamentations.

"Ultimately we arrived at the beach, when we were taken on board the Italian cruiser Piemonte and conveyed to Palermo."

A woman who escaped unhurt told of her experience:

"We were all sleeping in my house when we were awakened by an awful trembling which threw us out of our beds. I cried out that it was an earthquake, and called to the others to save themselves, while I quickly pushed a few clothes into a valise. The shocks continued, seeming to grow stronger. The walls cracked and my bureau split in two and then crashed to the floor, nearly crushing me. My hands trembled so that I could scarcely open the doors.

"To increase the terror a rainstorm, accompanied by hail, swept through the broken windows. Finally, with my brother and sister, I succeeded in gaining the street, but soon lost them in the mad race of terror-stricken people, who surged onward, uttering cries of pain and distress. During this terrible flight balconies, chimneys and tiles showered down upon us continuously. Death ambushed us at every step. Instinctively I rushed toward the water front, transformed into a muddy,

many of the prisoners escaped, so that a number of desperadoes are let loose upon the ruined city.

"The custom house, railroad station and all buildings and institutions disappeared, not a single official or public functionary remaining.

"The streets are so completely gone that it is impossible to find one's way about. The offices of the Bank of Italy have been wrecked, but the safes in the strong rooms remain intact with their treasure in them.

"Some few dead have already been recovered from the ruins and buried in the public gardens. The search for the wounded and injured in the debris is being vigorously prosecuted and there is hope that even now, two days after the earthquake, further rescues may be made."

In his second letter, written on the day following, Marquis di Ruvovento says:

"I am sending this message by motor car to Catania, as it is still impossible to telegraph from Messina or the neighborhood.

"The estimate of the total dead in Messina, Reggio and all Calabria has risen to 300,000.

HAVOC WAS UNIVERSAL.

"The disaster exceeds all efforts of imagination and the havoc is so vast and universal I scarcely know how begin to describe it. The horror of it all is, indeed, beyond words.

"When I enter the ruined area from Catania I find myself a prey to indescribable emotions. The spectacle that greets the eye here is beyond the imagination of Jules Verne. The Corso Cavour at Messina is nothing but a huge mound of stones. In company with a deputy I endeavored to explore it. It was 5 o'clock in the evening and already dark, and rain was falling. We first saw a homeless family sitting on a heap of stones. They were half naked and huddled together under a single umbrella. We asked them to come with us and be relieved, but they refused, saying they preferred to die on the ruins of their home.

"Hard by a poor white-haired woman was shivering on the ground, covered only with a bed quilt. She begged for help, saying she had been an artist at the Pelolo Theatre. She was barefooted and practically naked and said she had eaten nothing in three days. We asked her

to come with us to the station, but she would not go save on condition we brought her a pair of shoes. This was impossible.

"We were then forced to return on account of darkness, and, tired and hungry, we arrived at the station. It was thronged with a half-mad, terrified crowd. There was no water and nothing to eat and nowhere to sit down.

TWENTY ROBBERS SHOT.

"Numbers of peasants from surrounding villages have flocked into town to rob the corpses and sack the ruins. The authorities have ordered that these ghouls, when found, be immediately shot. Twenty were thus executed yesterday, and one wretch was discovered by a Russian sailor in the act of cutting off a finger from a corpse for the sake of a ring, and was shot with a revolver. Martial law has been proclaimed.

"The survivors were awakened from their sleep by the disaster and ran unclothed into the streets. Subsequently they were compelled to cover themselves with anything they could find. The results would in other circumstances be ludicrous, some of the men being clothed in skirts and bodices and some of the women in military uniforms, while others of both sexes have nothing but blankets wrapped round them.

"Here among the ruins I encountered an acquaintance, Baron di Scotti. He was covered with mud. He wore a pair of white undergarments, an opera hat and wooden sabots. I met a survivor of an Italian family named Bonanno. He carried a dead child in his arms and appeared to have lost his reason. Several people were literally stricken dumb by the catastrophe, but their silence was counteracted by the groanings from the wounded who still linger invisible, but not inaudible, beneath the ruins.

"Help is arriving constantly from Catania and Palermo by sea to relieve the thirst and famine. The whole Calabrian shore for a distance of nearly thirty miles was torn and twisted by the convulsions of the earth and sea. Neither bridges nor ferryboats exist, all having been destroyed.

"The town of Villa San Giovanni was destroyed, and Scilla, Pizzo and Bagnara shared its fate, in each case the havoc of the earthquake being completed by the outbreak of fire.

"One fugitive declared that the hills opened and swallowed up four

CHAPTER VI.

REGGIO VANISHES IN TIDAL WAVE.—WHEN IT FINALLY EMERGED FEW OF ITS 50,000 POPULATION SURVIVED.—NOW AN UTTER RUIN.—FACE OF COUNTRY CHANGED.—ANARCHY.

BUT Messina, while by far the greatest sufferer, was not the only city devastated. The gruesome roll of the dead elsewhere in the stricken region equalled, in the aggregate, if it did not exceed that of the city by the straits.

Messina had more property loss than any other one point. More men, women and children's lives were ground out there than in any other city.

But that was only because Messina was the most populous town in the stricken region—in that gory belt of death that stretched from the heart of the isle of Sicily northeastwards under the Straits of Messina and through the centre of Calabria, the most southerly of the provinces, or states, of the Kingdom of Italy.

In Messina, horrible as was the disaster, one person in ten escaped the holocaust.

In many of the smaller towns and villages within the range of many miles, not a human being lived to tell the tale when the sun rose on that memorable 28th day of December, 1908.

Messina's prominence in the annals of the disaster is due more largely to the fact of its great size and reputation throughout the world than to the completeness of its destruction or to the proportionate loss of life.

Next to Messina, the quaint and beautiful city of Reggio di Calabria was the greatest sufferer. This charming town, the capital of the province of Calabria, lay nestled at the water's edge on the mainland, some eight miles or so to the southeast and across the straits.

When Messina collapsed, steamships hastily put out to cross the straits for help. Half way over they met scarred and battered ships from the other coast, carrying the news that Reggio, too, had perished.

And that before the terrible tidal wave that dashed from the opposite Sicilian shores had engulfed the city and had buried beneath its foaming crest almost all of what had remained of the city's fifty thousand inhabitants.

Reggio, before the shock, was a live and prosperous port, and one of the most ancient cities of Italy.

It was embalmed in the annals of history long before the Christian era, when it bore the name of Rhegium.

Previous shocks of earthquake, especially the great one of 1783, had left its scars upon the ancient palaces and the cathedral, but until that one terrible day in the Christmas week of 1908 it still nestled in fancied security at the foot of grim Montalto, which reared its vine-clad head almost five thousand feet towards the heavens to the back of the town.

NOW AN UTTER RUIN.

To-day, the city is in utter ruin, ruin as complete as that which wiped Messina off the map. Yes, worse! For the tidal wave here swept over the entire town, so deep that the bodies of fish were found, after the death-dealing flood finally had receded, as high up as the third floors of a number of houses that were so sturdily built that their shells at least were able to defy not only earthquake, but flood and flame.

Could any human beings be expected to survive that shock, that flood, that fiery visitation that swept the still dripping ruins? Yet some few lived to tell the tale. Few enough. But some.

Not a scene of horror at Messina but had its ghastly counterpart here.

The tidal wave that swept into Reggio flooded the city to a depth of many feet above sea level. Some of the houses along the water front were swept from their foundations and dragged out to sea.

Twelve miles of the railroad near Reggio were destroyed.

The tempest added to the terror of the scene.

The few Reggio survivors wandered nude and demented about the ruins of the city searching for food.

Practically all the pupils of the Reggio College perished. The little

CHAPTER VII.

DEVASTATION IN SMALLER CITIES.—TERRIFIED CROWDS PRAY.—
LIVED ON DOG MEAT.—NO PART OF CALABRIA ESCAPED.—TER-
RIBLE FLIGHT OF BAND OF REFUGEES.

ALTHOUGH DEATH, the grim reaper, garnered his richest harvest at Messina and Reggio, the devastation over a vast stretch of territory was even greater in proportion to the population and property valuation.

Not a house in Castoreale, with more than 10,000 population, escaped. Only a few of the inhabitants survived.

Catania, with 146,000 population, was badly damaged by both the earthquake shocks and the tidal waves which swept the coast, but the loss of life was not so heavy as in some of its less fortunate neighbors.

Palmi, Casano, Cosenza, Bagbara, Riposto, Seminaria, San Giovanni, Scylla, Lazzaro, Cannitella and all the other towns bordering on the straits were swept into ruin in that one instant, in many cases not a single person escaping.

The gravest damage was done to public buildings and churches at Floridia, Noto, Chiaramonto, Vittoria Paterno, Terranova, Marianopoli and Naro.

At Mineo there were several shocks. At Augusta, which once before was destroyed by an earthquake, the tidal wave wrecked the Government salt works. The prisoners employed there mutinied, but were suppressed.

At Patti the shock was accompanied by a blinding flash of light, while serious havoc was wrought at Barcelona and many persons were killed at Montagano.

At Caltanissetta, a Sicilian town of 30,000 people, many houses were demolished. Vast crowds gathered in the parks and filled the churches, praying for deliverance.

Similar scenes of panic were witnessed at Mineo, a town one hundred miles southwest of Catania.

CHAPTER VIII.

A KINGLY KING TO THE RESCUE.—QUEEN SAVES CHILDREN.—VICTOR EXPLORES RUINS.—NARROWLY ESCAPES DEATH.—HELENA HURT IN PANIC.—DUKE AND DUCHESS OF AOSTA JOIN IN WORK OF MERCY.

ALL Italy, paralyzed by the magnitude of the disaster that devastated Eastern Sicily and Calabria, was fired to an earnest determination to relieve suffering and succor the distressed by the noble courage of its King and Queen.

King Victor Emmanuel and Queen Helena, as soon as they heard the first tidings of the calamity, rushed to Messina on board the battleship *Vittoria-Emmanuele*. They disembarked immediately and made their way into the ruined city.

As soon as it was known that the King and Queen had come crowds of the terror-stricken survivors of the earthquake swarmed around the royal party, prostrating themselves in the mud and crying aloud for pity. This reception was too much for the Queen, who almost fainted.

Many terrible stories were told to the King in connection with the work of rescue. His Majesty lost little time in listening to a recital of difficulties. He immediately joined a rescue party, and labored as unremittingly as the others. He personally extricated several injured persons pinned under the ruins.

The Queen quickly recovered her courage and followed the example of her husband. She devoted her attention principally to the little children. She rescued with her own hands a little boy three years old, bleeding from many cuts and wounds, and herself carried him to the deck, where she handed him over to members of the hospital corps.

People wept from emotion when they saw the King and Queen. The women threw kisses to her Majesty. Both virtually were carried in the arms of their subjects.

The presence of the King acted as a general inspiration. Even the

wounded found fresh strength when they learned his Majesty had come among them.

An aged man who had been abandoned under a beam that apparently had crushed out his life, revived for a moment at the shouts of greeting to the royal pair. He stretched out his hand and raised his head long enough to call out:

"Now, I can die happy. Long life to the King."

He fell back and expired.

KING EXPLORES RUINS.

The King explored the ruins regardless of the danger to which he exposed himself. He was often moved to tears at the scenes he came upon at every turn.

The Queen spent most of the day in the wards of improvised hospitals, visiting the wounded, many of whom have lost all that was dear to them. Her Majesty often broke into sobs as she listened to their dreadful tales of suffering.

King Victor left Messina that night with Queen Helena and arrived early the next morning at Reggio, and after visiting the town in company with the Queen, re-embarked on a warship and visited all the wrecked villages along the Sicilian coast, everywhere meeting the same scenes of desolation. The next day he visited the villages and hamlets in Calabria that had been overwhelmed.

The visits of the King and Queen aroused widespread enthusiasm.

In spite of the universal mourning and distress the sovereigns were saluted when they disembarked by the firing of guns from the Italian and foreign warships at Messina. As the King and his party set foot on shore they were greeted with scenes of indescribable woe. His Majesty spoke highly in praise of the Italian soldiers and the sailors from the foreign warships for their heroic work of rescue.

He visited every quarter of Messina and Reggio, giving words of encouragement, praise and consolation.

The Queen talked with the wounded on board the ships, comforted the women, spoke kindly to the children, and promised assistance. Every-

CHAPTER IX.

BURYING DEAD IN TRENCHES.—QUICKLIME TO DESTROY BODIES.—AN IMPRESSIVE FUNERAL CEREMONY.—AMERICAN QUIETS THEIR FEARS.—PROPOSAL TO MOVE CITY.

AFTER comparative quiet had been restored and the Italian people had recovered from the first shock of the horror, they faced most terrible problems of the future—yes, and of the immediate present.

In the first place, though many thousands perished, there were other thousands, many of them maimed and incapacitated for work, who must be transported, temporarily at least, to some habitable regions, clothed and fed.

Next, to avoid a pestilence, there were yet more thousands of bodies to be dug from at least the upper part of the debris and buried, or, in any event, destroyed by quicklime.

This latter expedient, which did much to avert an epidemic, was proposed by the King himself, while face to face with the horror of the situation. He fully realized the menace of any other course and himself issued the orders for its use.

Of the bodies buried, hundreds were thrown into trenches and covered with the destroying agent.

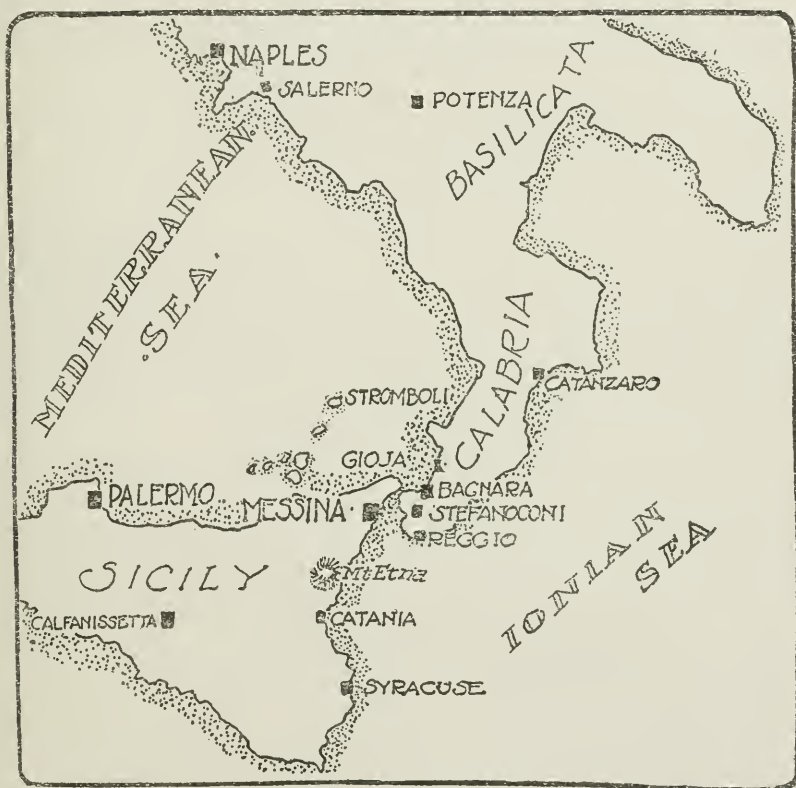
A most impressive funeral ceremony was witnessed near Messina, about a week after the disaster, when Archbishop Barrigo made his way through the town, through the ruins of the city, to the cemetery at Mare Grosso, and blessed a grave 100 feet wide and 30 feet deep, containing 1300 bodies. The dead were piled one on top of the other, and covered with quicklime.

The prelate was followed to the cemetery by a large gathering of survivors whose lamentations mingled with the Latin words of the service and benediction.

Subsequently, the Archbishop walked through the ruins and blessed the military hospital, the military college, the barracks and the Archbishop's house, considering these wrecked edifices as so many ceme-

animals unburied, the occlusion of drains and the filling of the wells with salt water, epidemic diseases would break out.

"The territory involved covered 150 square miles, but sanitary work was conducted by the Marine Hospital Service, and although careful records of disease were kept, it was demonstrated that no disease of an epidemic nature developed.



MAP SHOWING COUNTRY DEVASTATED BY EARTHQUAKE
AND TIDAL WAVE.

"There is no record of epidemic diseases following the great fires at Boston, Chicago and some of the other large cities of the United States.

"It is observed that there was some appearance of typhoid at Messina following the earthquake, and this disease might naturally be expected to spread to some extent, due to the overturning of all sanitary conditions, and if the people are placed in camps there may develop some

native land feel so certain of the greatness that Syracuse inherits from Messina are already in negotiation for the nearest ground to the fountain of Arethusa on which to erect "an American hotel," to be in time for the influx that is sure to follow the "boom."

Sentiment and money making couldn't devise a better site. For the fountain to this day invites the delight of the visitor. It has been walled in by marble battlements to guard it against pollution and holds about the same place in popular reverence that the fountain of Treves enjoys in Rome.

The stream which issues from the solid rock forms a considerable body of water and glides away as clear as an Alpine "brunnen" to mingle with the harbor waves a mile or more away.

The Arethusa waters were guarded in the same way in Cicero's day, for he takes pains to mention that "In the island of Ortygia there is a fountain of sweet water, the name of which is Arethusa of incredible flow, very full of fish" and that it would be overwhelmed by the sea were its waters not protected by a rampart and wall of stone.

A FAMOUS FOUNTAIN.

Before the beginnings of man, as known to modern times, Arethusa is said to have made use of the delectable pool to bathe with her nymphs. This memory seems to have been lost to the inhabitants during many a century, for it was only a few decades ago that the pool was rescued from the washerwomen of the outskirts, who dipped the soiled clothes of the numerous suburban families in the precious waters.

Syracuse possesses many a memorial of majestic significance with which to divert the curious in its coming day of greatness.

In the centre of the Ortygia peninsula, which forms the modern city, greatly resembling Manhattan island in its conformation, stands a duomo, or cathedral, linking a very distant past with the banalities of to-day.

The cathedral "Santa Maria Del Piliero" (Saint Mary of the Column, or Pillar), was built by the Greeks six hundred years before Christ to do honor to the goddess Minerva. Shortly after the apparition of Saint Paul the Christians managed to obtain possession of the edifice and transformed it into a place of worship of the new God.

Disentangling the various relics of changing creeds will furnish the studious tourist with enlivening occupation, for the Christian edifice was transformed into a Moslem mosque, then into a Greek church, and to-day a Roman temple of worship.

Though remodeled by Christian and pagan, the same columns and material compose the edifice, so that with history in hand the visitor may see in his mind's eye the procession of diverse worshippers that celebrated devotions to the unknown god. There Archimedes, in the intervals of his scientific inventions, repaired to consult the oracles; there Marcellus, the Roman conqueror, forbade his soldiers to enter, but he couldn't stop the vandal pro-consul, Verres, from looting the temple of its incomparable statuary which he employed the legions in carting away by night.

To the art folk the most interesting relic of the past is a more than lifesize statue of Venus Anadyomene, discovered in 1804 by the Marquis Landolina in his gardens. Connossieurs hold this ample figure in finer work of art than the Venus de Milo in the Louvre, or the Venus de Medici in the Pitti Palace. This Venus Landolina is said by the learned to be a celebrated work modelled in Athens for the unspeakable Roman travesty of an Emperor, Heliogabalus, who in a moment of generosity presented it to the city of Syracuse. Though the head and right arm are lacking, the figure is held by art folk to far transcend in benignant grace any other Venus in existence.

REMINISCENT OF PLUTARCH.

Should Syracuse inherit Messina's fortunes, the readers of Plutarch will be apt to revive their interest in one of his heroes at least. Timolean, who among all its vicissitudes, the city commemorated as its "grand old man." Timoleon, according to the devout belief of his contemporaries. "was favored by the gods wherever he went."

It was Timoleon (another Cincinnatus in conduct) who quit sequestration to rescue his compatriots from a swarm of tyrants and ended by routing the theretofore invincible legions of Carthage.

Even walking through the streets of the city, the tourist would feel

as if he were a contemporary with the worthies pictured in Plutarch's pages or in the stunning war and sea pictures of Thucydides.

A narrow and winding way named in honor of the mother of Venus, Via Dione. Another the street of the Duomo leads into the "Piazza Archimedes." La Via Maniace recalls the great captain who routed the Carthaginian armies. The "Passage Aretusa" shows that the city councils had sentiment in their political ministry of the people's affairs. Just outside the remote walls are the remains of two Doric columns which in Syracuse's great day marked the city's veneration for Timoleon's Archimedes.

The bones of the worthies are not identified with the columns indeed, even in Cicero's time there was dubiety as to the exact whereabouts of the tombs of Timoleon and Archimedes, though their names were always on the tongue of the public orators.

SARACENS CAPTURED CITY.

Cicero writes that he found the monument of the illustrious men "covered with brushwood and bramble" so that the monument was unknown to the Syracusans who even denied its existence.

The wretched Syracusans, however, may be excused for not knowing exactly where their great dead were buried, since when the Saracens captured the city in the year 878 before Christ, it was devastated about as thoroughly as Mount Etna did its work on Messina the other day.

Miles of mounds, broken columns and mouldering fragments of what were once colossal edifices, still make clear that in even those early days enterprising citizens had the modern fever of "greater cities."

When Ortygia, the peninsula, became crowded, the city extended across the narrow channel and took in finally Acradina, Tyche, Neapolis and Epipolae. Ortygia was known as the inner city, the other four as the outer.

These were enclosed by a wall one hundred and eighty stadia, or about twenty-five miles, in circumference.

That wouldn't be much, compared, say, with Philadelphia, but it must

be borne in mind that private dwellings took up no such space in the early days of the world as they do to-day.

Even the walls strong enough to resist the energy of the most valiant warriors of the world, have crumbled away.

When the greater Syracuse was in its prime, the harbor was walled by the city, for nearly four miles, and in that sheet of water some of the most terrific sea fights of antiquity were witnessed by the millions of citizenry, for in those days there was no danger of flying missiles to force the spectators to remain at a safe distance.

Scores of military students during the last hundred years have retold the incidents of the fight at Actium, one, a French admiral, actually naming many of the triremes, yet the combat between the forces of united, or half united Greece, and Syracuse was, according to the minute account of Thucydides, a far more determined struggle than Antony put up in defence of his adored Cleopatra.

As in most of the decisive victories recorded by Plutarch, and the Greek writers, there was treachery among the vanquished, which strips the victors of the glory their valor excited from end to end of the then known world.

But battling on vessels moved by three banks of oars, the fighting was far more desperate and even deadly than with powder and ball, for the fighting men had to come hand-to-hand and settle the matter by individual constancy.

In this fight, fifty thousand of the Athenian Greeks were counted gladiators and when they struck out against the Syracusans, it was like the meeting of so many Sullivans seeking the "solar plexus."

CHAPTER X.

WORLD RUSHES RELIEF.—AMERICA IN FOREFRONT OF MERCY.—PRESIDENT'S MESSAGE TO CONGRESS.—\$800,000 APPROPRIATED BY U. S.—RELIEF SHIP SAILS.—OTHER NATIONS AID.

ALL the world hastened to send to Italy not only its sincerest messages of sympathy, but more substantial help in the way of money and supplies.

Governments and individuals vied in their grand charity.

In this the United States was far in the lead.

No sooner had the news of the catastrophe reached this country than the President sent this cablegram to the King:

"His Majesty, Vittorio-Emmanuele, Rome.

"With all my countrymen I am appalled by the dreadful calamity which has befallen your country. I offer my sincerest sympathy. American National Red Cross has issued appeal for contributions for the sufferers and notified me that they will immediately communicate with the Italian Red Cross.

"THEODORE ROOSEVELT."

The American National Red Cross sent a telegram over the signature of its president, William H. Taft, to the Italian Red Cross at Rome in the following language:

"The American Red Cross desires to tender to the Italian Red Cross its profound sympathy because of the terrible earthquake in Italy and Calabria. An appeal has been issued to the American Red Cross for contributions for the benefit of the sufferers."

But America did not stop there. This Presidential message to Congress followed:

"The appalling calamity which has befallen the people of Italy is followed by distress and suffering throughout a wide region among many thousands who have escaped with life, but whose shelter and food and means of living are destroyed. The ordinary machinery for supplying the

CHAPTER XI.

THE STRICKEN REGION.—THE PATH OF THE RUIN.—SHAKEN AGAIN AND AGAIN.—PRIZE TOO OFTEN DEATH.—MAGNITUDE OF DISASTER.—QUAKES PERIODICALLY IN SICILY AND CALABRIA.

THE stricken region is something the shape of New Jersey, but it is larger; it was more populous. We may figure Messina as Paterson, a town about its size; every building is a ruin, every street a plague spot, the army in control, the refugees being removed to Pittsburg. Jersey City is scarcely larger than Catania, where the tidal wave smashed every small boat and half ruined all the town below the heights. Caltanissetta, the sulphur capital, is as large as Elmira; and a thousand dead lie there. In the seventy-mile circuit about Edna lie Giarre, Acireale, Paterno, Bronte, the town of Lord Nelson's title; Aderno and Belpasso, with 120,000 people. A population like that of Newark and the Oranges lies here in the perpetual power of Etna; we do not yet know how they have fared.

In the north it is the soil that yields harvests; in the south, the sun. We can form no concept of the extent of the terror without remembering the exceeding density of population wherever the cultivable shores invite industry. The railroad running from Messina to Catania is like that from New York to New Haven in the number and size of the towns and villages.

Imagine along all that distance a tidal wave of more than thirty feet, piled higher by resisting obstacles, and following an earthquake like San Francisco' The colder Calabrian coast facing the northwest is not quite so populous, but even there the earthquake found no lack of victims.

In a little time the world outside will turn to other topics more near, to it more pressing. We wonder at nothing long. But sine steam and the cable knit all nations closer together the brotherhood of man is better understood. It is only known that the earthquake is the greatest disaster of historic time; it is certain that no other has ever so appealed to the sympathy and the generosity of the whole world.

From the Sicilian mountains to the west of flaming Etna, Italy's broad road of immemorial ruin runs northeastward to Cotrone, on the Adriatic Sea. It is the path that the worst earthquakes have taken for the past thirty centuries. It is the path chosen by the great disaster of December 28, 1908.

Further back than written history goes the legends run telling tales of destruction wrought by the wrath of the heathen gods. Before the birth of Christ, so the dwellers in this smiling but treacherous landscape believed, it was here that was fought the tremendous battle between Jupiter and the giants for the conquest of Heaven itself. Enceladus, the leader of the conquered giants, was laid postrate and Mount Etna was piled upon him.

Even to this day some of the more ignorant of the survivors of the latest disaster believe that the earthquake is this ancient giant stirring in his pain, struggling to free himself from his bonds and to arise, and that the flames that made lurid the skies were his fiery breath.

Probably this myth had its origin in some such appalling disaster as the one that on that December night in 1908 laid waste once more the south of Italy and the east of Sicily.

SHAKEN AGAIN AND AGAIN.

In later times Calabria—the province that makes the foot and the ankle of Italy's "boot"—and Sicily have been shaken again and again by earthquakes, causing the death of unnumbered thousands.

Yet the land lies desolate but a little while, as time is measured by history. In a few years it smiles again with fruit and oil and wine, and then, when the living generations long have ceased to remember the dread tales of those that are gone the earth trembles again and this broad road of ruin once more is strewn with the bodies of the dead, whose only monuments are the stones of ruined cities piled above them.

The Italian clings to the traditions of his ancestors with greater tenacity, perhaps, than any other race.

Since history began to be written men have dwelt on the slopes of the volcanoes of Etna and Vesuvius, though knowing that any moment they might be overwhelmed by fire or lava or ashes. It is the ashes, in-

that town alone. More than once in modern times famine has destroyed its million people in India, but their pitifully dragging deaths lack the dramatic shock of earthquake. And then—they were so far away, so little bound to us by ties of blood, so apathetic even to each other's sufferings!

Mont Pelee did its work six years earlier with awful thoroughness, but within a little space comparatively. The wreck of Herculaneum and Pompeii was not in loss of life a great calamity. The earthquake that engulfed Lisbon was far less destructive, and for a horror to cap that we must go back more than two hundred years.

The great Calabrian earthquake of 1783, which stands out in the history of that oft-stricken country with horrid distinctness because of the completeness and accuracy of the reports which have been handed down, is credited with having killed 30,000.

QUAKES PERIODICAL IN REGION.

Earthquake and disaster have been periodical in Calabria and Sicily so long as the memory of man runs, and while the early traditional statements of the loss of life and property were doubtless exaggerated, the ascertained facts of history are sombre enough.

Less than half a century ago a careful observer made the estimate that in the Kingdom of Naples alone in the three-quarters of a century previous the annual toll taken by earthquakes was 1500 lives, and in the period since that date the disasters have been repeated and severe.

Wholesale emigration has not helped the situation, and the constantly recurring famine and pestilence in the train of the earthquakes have helped to make these provinces the most beautiful in Italy, and full of priceless historic association, the most backward in the kingdom.

What will be its future? Who shall say?

I have seen the peasants on the slopes of Vesuvius, laying the foundations of houses to replace their overwhelmed homes while the lava beneath their feet was still too hot to be touched with the naked hand.

Dig a foot down and it is a molten mass, red with the heat of nature's furnaces. Yet with desolation and destruction all around him, the peasant nonchalantly goes on with his owrk.

height and sending their pieces flying in every direction cause many to perish.

In Japan, which is a more highly seismic country than Italy and whose climate is much the same as that part of the latter country that is subject to earthquakes, the houses are mostly of bamboo, and of the lightest description.

When the earth rocks there, even if the bamboo dwellings do fall, the inhabitants crawl out of them quite unhurt, and the loss of life and property is small. It is rare to hear of many perishing from an earthquake in Japan, unless it be accompanied by a tidal wave.

JAPAN'S GREATEST ADVANTAGE.

But while bamboo is cheap and available in Japan, neither that nor wood of any description exists in abundance in Italy. It is a country comparatively denuded of its forests.

Those that are preserved are jealously guarded, and wood is costly. Even the "box shooks"—as the thin strips of lumber from which the boxes in which lemons are shipped are called—are sent from this country.

Stone, on the other hand, is plentiful and cheap. Therefore, every building is of stone, some a little more massive than others, according to the wealth of the owner.

But even the structure with the thickest walls will fall apart when the earth rises and falls like the sea.

The cities of Central and South America, where violent shocks are felt occasionally, are built almost entirely from concrete, which makes an entire edifice one homogeneous mass, just as if it were carved from one solid block of stone. These withstand the impact of the jolting earth far better than structures where stones are piled one above the other.

Yet, strangely enough, in southern Italy, in the very country where cement was invented by the Romans, but few of these concrete buildings are to be found to-day.

Most of the examples of concrete construction are bridges and arches built by the Romans themselves from ten to twenty centuries ago. These, despite a little outward crumbling at the corners and surface cracks, are as strong as if they were put up within the last decade.

CHAPTER XII.

SCIENTISTS DISCUSS DISASTER.—HEAT AT EARTH'S CENTRE.—EARTH PRESSURE RIGID.—DISTRIBUTION OF STRESS.—TEN MILES OF ROCK.—PROFESSOR HILL'S THEORY.—EARTH A LIVING MECHANISM.—PHENOMENA OF THE PRESENT.

THE recent appalling disaster in Southern Italy—one of the greatest disasters that has ever befallen the earth—in which entire cities and villages were swallowed up by earth and sea, and hundreds of thousands of lives were lost, has created a worldwide inquiry into the present physical condition of the earth we live on.

A man need not be a cynic to ask, "Is this earth a safe place of abode?" Apparently not in certain spots.

With volcanic eruptions, earthquakes and tidal waves occurring in some places, what is to prevent similar unexpected outbreaks in others? Nothing at all, under similar geographical conditions.

These and many other questions and answers have probably arisen in the mind of every speculative man and woman since the dawn of the new year, when the full extent and horror of the Italian disaster began to be fully realized. And it is scarcely to be expected that very much consolation will be derived therefrom, or even from the statements of some scientists regarding this earth's internal troubles, their alarming causes and probable disastrous results.

It is not very comforting, for instance, to be solemnly informed that we are living to-day on the outer shell of a high pressure boiler, which leaks badly in certain weak spots and "blows out" with alarming frequency, along a certain weak plate which is geographically known as the "earthquake belt."

If you take a map of the world and draw a broad line straight across the Pacific Ocean, from the Philippine Islands to Panama, thence across the Atlantic Ocean through the British West Indies to Spain and Italy, thence continuing across Europe and Asia to Japan, and on to the start-

ing point in the Philippines, you will see exactly where the earthquake belt lies.

There are other minor belts, one of which passes southward along the coast of California and Mexico and the west coast of South America. There are evidences observable to-day in practically all parts of the world of other earthquake belts in which tremendous geological changes and upheavals were wrought in prehistoric times.

Even New York City is in an earthquake belt. At some time, probably thousands and thousands of years ago, a mighty earthquake split asunder the rock that united what is now the island of Manhattan to the Palisades of the New Jersey coast. That earthquake formed the Hudson River.

Earthquake belts are admittedly weak spots in the outer crust of the earth—the high pressure boiler on which we live—and there is no evidence that any of them were ever permanently repaired.

SAFE FOR A TIME, ANYHOW.

Professor Edward Seuss, the eminent Vienna geologist, predicted a few days ago that eruptions would follow earthquake and tidal wave in Southern Italy. He attributes the earthquake to the sinking of the earth's crust, otherwise a buckling of the boiler plates, in the zone of which the Lipari Islands are the centre. He declared that as the process of sinking went on the Calabrian and Sicilian highlands on either side of the Straits of Messina would be submerged, only the highest peaks remaining above the sea. The strait, he said, would thereby be greatly widened.

Professor Suess is of the opinion that the earth's crust is gradually shrinking everywhere. There is consolation to be found, however, in his further remark that the life of the human species will be too short to make this phenomenon important to mankind.

The average thickness of the earth's crust, the boiler plates, is generally assumed to be fifty miles and its average density to be about five times that of water. Scientists have estimated that the downward pressure at a depth of fifty miles below the surface of the earth is somewhat in excess of half a million pounds to the square inch. It is a safe conclusion that within a large portion of the earth's crust there exist pent-up

gases, particularly steam under a pressure equal to that exerted by the most powerful high explosives. High explosives probably exert pressures ranging from 200,000 to 350,000 pounds to the square inch.

When a high explosive is detonated the amount of pressure depends upon the volume of gases liberated and the temperature of the gases. Nitroglycerine, exploded in a space where it could not expand, would exert a pressure of probably from 300,000 to 350,000 pounds to the square inch. The pressure would certainly be less than half a million pounds to the square inch, although the temperature of the gases would equal the boiling point of steel. Consequently, with a 500,000 pound force holding in check a 350,000 pound force which is continuously exerting itself in an effort to burst the earth's crust asunder, it is reasonably safe to assume that the stronger force will continue to prevail, for some time to come at least, and that there is not the slightest danger of the earth blowing to pieces.

WEAK SPOTS IN EARTH'S CRUST

Unfortunately, as the appalling record of earthquakes shows, there are many very weak spots in the earth's crust. Deep down under the crust, where water has entered through faults, to be entrapped and highly heated, with no room for expansion, it dissolves the rock, and as under the enormous pressures it forces its way through narrow crevices to new positions it cuts new channels in the granite floors, just as in glacial time subglacial streams cut passages through the ice.

Consequently, when the eruption of a volcano takes place, relieving the pressures in the deep passages under it, there is a rush toward the outlet of streams of superheated water made syrupy with stone in solution. As these streams of silica-charged water find vent at the volcano the expansion of the pent-up stream takes place with explosive violence, forming volcanic dust and pumice stone, which are belched forth in stupendous quantities. Then portions of the earth's crust, which have been resting upon a support of steam under dynamite pressures, naturally sag and shift when those pressures are removed or materially lessened.

The vast amount of solid matter ejected at times from volcanoes is difficult of comprehension. The great volcano Krakatoa had been ex-

inct for ages when, in 1883, its top blew off with a shock felt clear through the earth, and with a blast that sent a wave of air around the earth three times, while the fine volcanic dust did not entirely settle out of the atmosphere for more than two years, as was indicated by the unusually brilliant display of red sunsets. It is estimated that more mud was ejected from the mountain on that occasion than the Mississippi River discharges in two hundred and fifty years. This was the greatest volcanic eruption in historic times. The distance is not too great nor the time too remote for the eruption of Mont Pelee to have caused the earthquakes of San Francisco, Valparaiso and Kingston, while possibly Vesuvius may have played a material part.

EARTHQUAKES TO CONTINUE.

In the opinion of the astronomical editor of the Almanach Hachette, earthquakes will never cease until the shell, or crust, of the earth rests upon a completely solidified block. The earth will then be in a form which only exterior forces can modify. But at this distant and fantastic epoch the sun will no longer send us heat, and the earth, like the moon, will have become a wandering sepulchre in the vast abysses of space, without atmosphere.

For the benefit of any who may be anxious to find some place on this high-pressure boiler beyond reach of earthquakes and volcanoes, attention is directed to a statement recently made by Professor T. J. J. See, in charge of the naval observatory at Mare Island, Cal., and professor of mathematics in the navy.

"There are a considerable number of earthquakes which occur inland," said Professor See, "but it is found that they all occur in regions of abundant underground or meteoric water, while none at all occur in the great inland deserts. The great deserts, like Sahara, are the only regions on the earth wholly free from the danger of earthquakes, though in many places where the sea is shallow and the rocks are little broken the leakage is very gradual, and no severe shocks occur.

"This is true for Northern Europe and the eastern part of the United States, for example, and both of these regions are comparatively free from earthquakes. In deep seas, where the pressure is great, as along the

as the quake in San Francisco. The disturbance on the Pacific coast extended for an area of over 200 miles, while the actual place of disturbance in Italy was very much smaller.

"Of course, to the minds of the superstitious and the scientifically disinterested, there is in an earthquake an extraordinary element of unknown horror, of an impending disaster that lies under our feet, over which we have no control, no forecast, and no means of protection. It comes suddenly and in a few seconds, perhaps, destroys hundreds of thousands of human beings.

"The actual mystery of the earthquake is only partially explained in scientific research, that, by deductive theories, only manages to pacify our awe of the unknown.

"There are things we know about the interior of the earth, and many things we don't know, but would like to. We are ourselves merely on the crust of the earth, which scientists have variously estimated to be from ten to fifty miles below us. From the inner edge of this crust to the centre there are, presumably, gaseous matter substances of excessive heat.

HEAT AT EARTH'S CENTRE.

"The temperature of the centre of the earth, which has been sensationally declared to be 'inconceivable' by Flammarion and others, is probably not so at all.

"Calculating a conception of these inner temperatures of the earth by the increasing heat that miners find as they descend deeper and deeper into it, it may be assumed that the probable temperature of the centre of the earth is about equal to that of an arc light or an electric furnace, which is about 5000 to 6000 degrees Fahrenheit.

"We have a fair precedent for this theory in the temperatures taken in the Yellow Jacket Mine, in Michigan, which is, perhaps, the deepest hole that has been made in the earth, extending a little over a mile from the surface toward the centre.

"In the deepest part of this mine the temperatures, which are not much worse than the heat of a summer day in Arizona, represent about one-four-thousandth of the entire distance from the surface of the earth

"The surface of the earth can be compared to the top of a barrel of asphalt, hard and rigid through and through, seamed and cracked on the surface by the elements.

"For ten miles in a straight line below the surface the earth is probably dry and hard, of a rock substance. The pressure of this substance upon the heated center of the earth keeps it from getting hotter than it is, just as you can keep water from boiling by an appropriately sufficient pressure. The fact that there is steam in volcanic eruptions is the leakage of the interior pressure of heat in the earth.

"The character of matter in the center of the earth or its immediate environment must be something like pumicestone, porous, light, because when the earth's interior matter is melted in the high temperatures that are there it dissolves and there is considerable water in it that escapes through volcanic craters in steam.

"Volcanoes and earthquakes, though undoubtedly related, are not inimical to one another, and are not alike. This is shown in the fact that destructive earthquakes may occur, and have occurred, in regions quite remote from volcanic eruption.

KNOWLEDGE THEORETICAL.

"The lava that streams from the crater of a volcano is a sudden release of the inner boiling liquids of the centre of the earth that in their transition from their origin to the atmosphere undergo innumerable stages of chemical change and evolution, causing the various strata of mineral quality that geology is continually uncovering.

"The passage of these interior liquids of the centre of the earth may be tortuous, frequently caught in the overarching pockets that the earth causes in its readjusting upheavals, and remaining there for years, slowly working out a chemical activity for its own release.

"The deeper one penetrates into the causes of the internal mystery of the earth, the more obviously theoretical is our knowledge.

"I do not believe there is any relationship between sun spots and earthquakes; the elements and celestial influences are not concerned in the inner activities of the earth.

"The temperature of heat in the centre of the earth which was di-

"Another cause of destruction was the tidal wave.

"It takes a comparatively small upheaval of the bottom of the ocean to make a huge and destructive tidal wave. An upheaval that would make a hole in the sea bottom of forty or fifty feet would be enough to produce a tidal wave twenty or thirty feet high.

"So far as we can conceive, with the help of scientific precedent and geological observation, there are sections of the earth that have apparently become immune to earthquakes, but there is no assurance of the matter. The disaster in Sicily was probably local, and could have no forecast in it of similar disaster in any distance directly in line but away from it.

"Our observatory at Columbia is in direct latitude with an observatory in Naples, but there is no connection between longitudinal or latitudinal lines around about the earth with earthquakes.

"In its scientific character the disaster in Italy is not so startling or important as the earthquake in San Francisco, but its aspect of human catastrophe has probably never been equalled in the history of man."

ANOTHER SCIENTIST THEORIZES.

"There are so many superficial reasons given for the cause of earthquakes," said Professor Robert T. Hill, "that considering their apparently authentic sources are surprising.

"Earthquakes, as terrible as they may seem when they destroy a few thousand human beings, are but one of the many manifestations which we have of the world at work, and their full significance is only comprehensible to one who has eliminated from his mind the idea that we are living upon a dead and finished planet.

"That is not only an old theory, but according to all the significant indications of intelligent science utterly untrue. The earth is not a dead planet, and very far from being a dying one. Its activity is eternal, its physical vitality is as restless and eager as the life of a growing child.

"The earth is in a constant quivering tremor of constructive change. I cannot understand how the superficial impression prevails among some scientists that earthquakes and volcanic eruptions are signs of the earth's destruction.

no prediction of an earthquake any more than sultry temperatures, or thunder and lightning have anything to do with it.

"The clouds that usually hover over active volcanoes have no immediate relation with an earthquake, as is frequently supposed. The clouds are a natural evaporation of the steam and gaseous substances thrown out of the crater.

"The plant and forest life of the crust of the earth is only a parasite life that draws its substance and food from the universal volcanism that supplies it with material to blossom and flourish.

"Proceeding from the contention that every part of the earth's material is a by-product of the inner activities of the centre of the earth, the world's obligation to that activity makes the process of adjusting earthquakes a promising assurance of the continuity of our planet.

MOVEMENTS GOING ON.

"Quake movements, more or less imperceptible, are going on all the time in many places every day. There is no guarantee, nor, in view of this theory, would we wish to have one, that the earth's tremors will cease.

"Professor Penck, the distinguished German geologist, with whom the Kaiser recently honored this country by sending him as an interchange lecturer, gave an illustrated lecture in New York a few weeks ago, wherein he showed the effects of some of the great movements of the folding and sliding Alps.

"These geologic movements are going on in many places to-day. Occasionally they move with a jerk, and then it depends on who is in the way.

"This is what happened in the awful disaster in Sicily, that has happened in the history of this world as far back as we can read about it.

"No one knows the hour or the place where the mountains will slide of the sea climb over the land—but the earth must not be deprived of its geological privileges to build and rebuild, because its crust is inhabited, covered, by parasites—human or otherwise."

Dr. Harry Fielding Reid, professor of geological physics at Johns Hopkins University, and one of the leading authorities in the United

CHAPTER XIII.

MESSINA WRECKED MANY TIMES.—MOUNT ETNA'S WRATH.—SCENE OF
CATASTROPHE.—CITY FOUNDED BY PIRATES.—ITS AWFUL HISTORY.
—RESEMBLES LISBON.—REGGIO AND ITS CATHEDRAL.

THE portions of Southern Italy and Sicily laid waste by the earthquake, tidal wave and devastation of Mount Etna are not only those which have been most sorely afflicted in the past by great convulsions of nature, but are those which, for the sake of art, historical interest and certain commercial aspects of themselves and the world at large, were best worth guarding against destruction.

The path of the great disaster ripped through the Straits of Messina, with Reggio di Calabria as a starting point. These two cities, Messina in Sicily and Reggio, her Italian neighbor, were more completely demolished than any others, and from the population of these two were most of the thousands of victims of the gigantic death list contributed.

Catania, in Sicily, the most populous city next to Palermo, but in reality scarcely more than a wraith of its ancient self, suffered incalculable damage from the tidal wave which flanked the earthquake like a solid wall rising from the heaving seas.

Syracuse, once the most important of the Sicilian towns, on the lower curve of the bay, was swept by the tidal wave and the devastation included one of the finest of the cathedrals of the country.

Mount Etna, which disgorged itself steadily all day and poured its deadly lava down toward Messina, contributed to the slaughter a more vicious eruption than any since 1886.

Messina, which suffered most under the catastrophe, and which sacrificed more of her inhabitants to the final score of dead and injured, is, next to Palermo, the capital, the chief commercial city of Sicily, with more than 100,000 inhabitants.

Including in this count the surrounding country and small suburbs adjacent the number is 147,106.

It is the seat of an appellate court and is an archbishopric, and boasts

a university unexcelled elsewhere in Sicily. Its university is situated on the Faro, or Stretta de Messina, a promontory due north of the city of Messina, which juts into the straits and reaches nearer to Calabria than at any other point.

Directly across from the Promontory de Faro is the great Calabrian rock Scylla, over which is the town Scylla.

This rock and the whirlpool beneath it, both of which are now lost under the lashings of the angry seas, formed the direful Scylla of Greek mythology, which with the Charybdis of eddies and unbridled currents in the straits, were thought by the ancients to be fraught with infinite danger. These cross currents have in recent years been greatly tamed, and Scylla is a delightful little port with no reminiscent suggestion of her quondam horrors.

SCENE OF CATASTROPHE.

On the Sicilian shore of these tumultuous straits is a range of rugged peaks. They lend dignity and grandeur to the wide stretches of scenery, and are second in all Sicily only to Palermo.

The harbor of Messina, which is formed by a peninsula in the shape of a sickle, was considered one of the best in the world and has an extensive steamboat traffic.

In 1899, 2,446 steamers entered the port, and 2,010 sailing ships, though more recently the trade has fallen behind that of Palermo. Oranges and lemons are the chief export, and of these more leave Messina than are sent from the whole of Italy. Almonds, silk, olive oil and wines have been staple exports also.

Messina was, comparatively speaking, well constructed throughout.

It had several beautiful streets, chief among which is the Via Garibaldi, named after his memorable invasion of Sicily when Messina was his point of attack.

About the edge of the brilliant harbor runs the Marino, or Corso Vittorio Emanuele.

Parallel to the Marino and the Via Garibalda are the Corso Caour and the Via dei Monasteri.

The original city lay between the torrents of Portaelgni, but it was

axilas, the tyrant of Rhegium, who introduced Messenians from the Peloponnesus, by whom the name was changed to Messina. The tyrant's sons were expelled a few years after his death and the constitution was re-established.

In the great Athenian war with Syracuse the city remained neutral.

In 396 B. C. the town was destroyed by the Carthaginians but was rebuilt a few years later by Dionysius of Syracuse only to fall again into the hands of the Carthaginians under Hannibal in 269.

The first Punic war, however, left the place in the hands of the Romans and the place was of importance second only to that of Syracuse and Lilybaeum in Sicily during a period of Roman occupation lasting for several centuries.

In 831 A. D. the town was taken by the Saracens, but in 1061 it was taken from them by the Normans.

ITS EVENTFUL HISTORY.

The city prospered greatly during the Crusades, being a favorite rendezvous for soldiers from the Continent en route to the Holy Land. In the Middle Ages also it became a flourishing commercial city.

Its commercial importance disappeared after a bitter struggle between the aristocratic faction, or Merli, and the democratic faction, or Mavizzi, in 1674. The democratic faction appealed to the French and the other to the Spaniards.

The former faction were at first victorious but eventually were deserted by the French, the city was taken by the Spaniards, and when the struggle was over the population was reduced from 120,000 to about a tenth of that number.

The town never fully recovered from this disaster. Whatever recovery was made was neutralized in the eighteenth century by a series of disasters.

In 1740 about 40,000 persons died of the plague, and in 1783 the town was almost entirely overthrown by the great earthquake of that year.

Great damage was caused by bombardment in September, 1848.

The cholera carried off no fewer than 16,000 victims in 1854, and earthquakes in 1894 and 1906 also caused loss of life and property.

In 1860 the town was occupied by Garibaldi. It became a part of united Italy the following year.

In respect to the feature apparently resulting in the greatest loss of life the Messina disaster bears a close resemblance to the great earthquake of Lisbon, which, on November 1, 1755, laid half the city in ruins and caused the death of approximately 40,000 persons.

Catania, just at the foot of Mount Etna, which is sharing the honors between the tidal wave and streaming lava, is the most populous city of Sicily except Palermo.

It is the seat of a bishop, and a university founded in 1445, which at the present time has 1,000 students, the flower of the intellect of Italy. It is situated about the middle of the east coast of Sicily and is one of the busiest and most prosperous parts of the island.

RESEMBLES LISBON.

Among other native products of the rich and fertile district about it are wine, grain, linseed and almonds, while large natural deposits of sulphur add materially to the wealth of the community.

Fully 8,000 vessels enter and clear the port annually. Catania is the seat of a notable Academy of Natural Sciences, founded in 1823.

It has taken a prominent part in investigating and developing the natural resources of Sicily, particularly has attention been paid to the possibility of earthquakes, and every possible research has been made that might serve to give warning of impending catastrophe and thus minimize the damage and loss.

Catania was founded by the Chalcidians in B. C. 729, and despite frequent severe losses from earthquakes, its people at least once in every century since have valiantly rebuilt the city, and its prosperity has grown rather than diminished, in its more than 2600 years of continuous life.

Catania has suffered materially from its proximity to Mount Etna.

In March, 1669, a fearful eruption of the volcano took place, which served to give to Catania one of the most interesting of the local folk

nected with Florence, in all her ways and manners, there is a refinement, a self-respect, a dignity and courtesy which give a charm to life.

The voices of the Florentines are soft and sweet; their manners are pleasant and kind; their city is clean and beautiful; their hotels and restaurants good and cheap. And that city is belted and circled with wealth. For miles in every direction the great villas are owned by rich Americans, English and Germans, who live there permanently simply because it is such a pleasant place to live and spend money in.

Sicily is by no means a bad place for beggars, although nowhere in the kingdom is poverty deeper. There is a sort of fierceness of pride about the Sicilian which impels him to put up a good front to the world in the midst of his starvation.

In six months in Sicily I never saw a woman barefoot, though one can see them every hour in Naples and all along the Riviera, east and west of Genoa.

To the Sicilian's notions it would be indecent for his women folk to go barefoot, and somehow or other he will keep them shod. Neither did I ever see women in Sicily dragging heavy trucks full of freight, which I saw both in Pisa and Como.

A FREQUENT PLEA.

The hotbed of beggary in Italy is Naples, and the beggar's plea in Naples is appalling to the American who understands it. The gentleman who is "carrying the banner" or "panhandling" in New York, or who finds his way up to one's kitchen door in the apartment house, says: "Lady, I've lost me job and ain't been able to find no work yet. Could you let me have ten cents to get a bed to-night?"

He makes it appear a temporary and unexpected lapse from the working class into the submerged tenth, and submits his plea in a casual, off-hand fashion. But the beggar of Naples, usually a woman, says:

"For the love of God, madam, one cent, one cent, to keep my child from starvation!" And she shows you the child, a wizened, awful baby; and clasps her hands in misery, and lifts her agonized face in a way that banishes sleep that night.

Perhaps it is a cold winter night—for winter nights are cold in Na-

CHAPTER XIV.

WHO SHALL IMMORTALIZE THE TRAGEDY?—THE SYMPATHETIC SOUL OF OUIDA.—HER FAVORITE THEMES.—FRENCH PROMPTNESS PLEASES SICILY.—ANOTHER IRELAND.

CONSIDERING that awful blow which fell upon the shores of the Messina Strait in the last days of 1908 this thought recurs with extraordinary persistence:

Had only Ouida been alive!

It is still too soon to tell whether of those now living, working in letters, there shall be born some memorable masterpiece as a result of this cyclopean tragedy. When Last Island disappeared a pen picture by Lafcadio Hearn so marked its going as to assure it in its death such glory as might never had come to it living.

The Martinique eruption is not to be traced by any fine literary monument. Had it not been for Gertrude Atherton we would have the same to say of San Francisco. Neither Galveston's flood nor Baltimore's fire added anything to our store of written art. Shall that be said, too, of Sicily and Calabria? Well, to-day we can only wonder, and wait. Had Ouida been alive one would hardly have had to wait long.

For, of all who have written of Italy, in English at least, it is the work of Ouida that seems fittest for this case; it is in her pages that we find proof after proof that it was her pen that would best have voiced the desolation and despair that have come upon the Southern Italian countryman. It was she, too, who would most have kept the rest of us wondering as to what her attitude would be upon the generosity the civilized world is showing in this stress of her beloved Italy.

The libraries are full of Italianate work in English, we know that well enough. There are novels upon novels by Marion Crawford and by Henry Harland that come easily enough to the mind; and such books as Norma Lorimer's "By the Waters of Sicily" proclaim themselves obviously enough.

Only a few years ago, too, Robert Hichens gave us in his story "The

And what a fight that was! In her novels, in her articles for the English reviews, always, for a score of years, she told the tale of Government and bureaucratic oppression of the peasant, and in innumerable ways she tried to swing the world's pity toward that pitiable creature.

Do you think of the Italian as the happy, singing creatures or simply as the prosperous person who sells you bananas on the corner, or as the grinning Neapolitan who dives after the pennies you have thrown him from your steamer? Well, then do you not know the poverty and misery of him; you must re-read your Ouida.

Was there ever penned, for instance, a more elaborate philippic against Government oppression of the Italian peasant than this author's novel, "The Waters of Edera?" Nor, if you would understand what sort of creatures in our human family are these now homeless on the shores of the Messina Strait, can you do better than read those tender tales, "The Silver Christ" and "A Lemon Tree."

Have we not elsewhere given you pictures of those stricken wretches praying and forming processions amid the ruined streets and lanes? You will find their types, to the immediate letter, in any of those early stories named.

OIDA'S FAVORITE SUBJECTS.

She wrote of Tuscany and Umbria, it is true; but, if never before, she would have been the first to write equally vividly of these Calabrians and Sicilians who now wail and mourn.

Such of us as know our Italy ever so little know that the Italians of the north were wont to look askance upon those of the south. If you alleged to an Italian of the north that you found the Italian in America by no means the best of citizens; if you referred to the Mafia or the Camorra, or the like, he simply shrugged his shoulders, and said:

"Ah, it is those rascals of southerners you mean!"

As if, for all the world, they were no kin of his at all. Again, in the detail of language, you know that the northerner looks down upon the southerner; and the Tuscan looks down on all the rest. But, in face of this calamity, all Italy is one. The whole nation mourns, Prince and peasant alike. Ouida, we cannot but think, would have mourned most

kingdom and this recalcitrancy has been one of the excruciating problems of the united state.

The Mafia has until recently really governed the electorate and the dagger has been a potent persuader in persuading majorities for outlaws that ought to be in prison or tranquilized by the electric chair!

Though Goethe, after his tour through the Southern lands wrote, "Italy without Sicily leaves no image on the soul, Sicily is the key to all," he pictures Messina and Palermo as the sites above all that made description vain, for it is impossible to give to words the quality that represents the scenic loveliness of a perpetual sunset land.

While every page of ancient history has something to say of Sicily, that land of beauty and delight is least written of by the moderns of all the territories that served as a stage for the portentous dramas embalmed in Grecian and Roman history, to say nothing of mythology. To all, save the archaeologists, it is always a surprise to learn that there are more remnants of Greek temples on the island of Sicily than in all Greece.

In fact, from Sicilian soil may be reconstructed more of the architectural characteristics of all the early nations than the rest of Europe can show.

For Sicily has been in its time the realm of a conquering segment of nearly every race since the disruption of the Roman empire.

EVERY RACE HAS LEFT RELICS.

Even the "Cliff Dwellers" have left their relics among the Tartarean caves of a soil so rich that a harvest a month used to be looked upon as normal. Prehistoric builders are represented by cyclopean structures, foundations of walls raised by Phoenician and Carthaginian conquerors, temples, theatres and fortresses erected by Greek hands, mingle with bridges, aqueducts wrought by Roman engineers.

Byzantine handiwork, mosques and minarets of the Saracens may be studied side by side with the palaces, castles and churches of the Norman-French conquerors.

For many a century Sicily was more a battleground of the nations than Belgium became during the seventeenth and eighteenth centuries.

Every known race was at one time or another master of the island, and every race has left relics of its tenure.

To the Greeks the island was a treasure house for food and supplies; to the Romans it was a land of loot for grasping pro-consuls, as well as a point of vantage for ambitious generals who, holding the territory, could force Rome to either fight or submit, to enterprising rebellion.

During fifteen hundred years the island was looked upon as the prize of the strong-handed. The Moslem and Christian disputed the land for centuries and almost on the site of the chasm that now represents what Messina was, the crusaders from France, Britain and Italy held rendezvous to set sail against the Paynim.

When the Greeks of the mainland saved the west from the incursions of the Persians at Salamis, a battle was fought at Himera, in Sicily, hardly less decisive than the slaughter on the Aegean. For a period the Moslem established the dominion of the African Califs on the Sicilian lands.

THE NORMAN CONQUEST.

One of the most dazzling kingdoms of the middle period between the Roman and the renaissance was that of the Normans, founded by remnants of the French crusaders. Then, in turn, the land was the subject of Suabians, Angevins (French), Aragonese, Catalans, Castillians, Savoyards, Austrians.

From the first settlement of the Ionian Greeks at Naxos, near the slope of Mount Etna, until the French revolution, Sicily was the prey of successive conquerors. Its authentic as well as legendary history reads like an endless volume of romance, ensanguined by wholesale slaughters either by war or earthquakes.

But the land is so lovely, the skies such perpetual panoramas of beauty, the air so clement, the foliage so luxuriant, that the dwellers forgot the ever-impending threat of violent death in the rapturous enjoyment of the satisfaction of the senses. When the destinies of the Grecian patria were at stake, it was in the waters of Syracuse that the frightful naval combat was fought, which Thucydides describes as the greatest sea fight the world has ever known. For centuries the "Siceliots" as the Sicilians were known in contradistinction to other Greeks, became

the cultivated people of the world. Their arts, philosophies, sciences, their poets and historians, ranked with elder Greece.

The magnificence of the Siceliot cities rivalled the utmost that Athens or Corinth was ever accorded. It was in Sicily that the modern Italian tongue arose while the Tuscans were still using the Provençalese or langued'Oc.

In spite of the incomparable greatnesses identified with Sicily, however, it is only when some frightful eruption of a volcano or earthquake destroys cities that the world is reminded of the mighty men and deeds associated with the island.

During the last decade pleasure steamers from ports in this country and Northern Europe have familiarized millions with the coast of Sicily.

The "conducted" touring parties land at the several show cities, from Palermo on the northwest, to Messina in the east, and Syracuse on the south, but there are no such volumes written of the country as depict the wonderlands of the continent.

GRANDEUR OF THE SCENERY.

This is all the more remarkable as the tourists, or the bulk of them, are generally educated folk who set out with their classic handbooks saturated with the mythologies of Greece, know what to seek for when they touch the enchanted land.

A day "off" was considered enough to satisfy the curiosity of the "conducted" tourists at Messina, for, unless the minds were filled with the dramas of a thousand generations, from the land of St. Paul on his way to Athens, to the butcheries of King "Bomba" in 1848, "Messina la nobila" presented to the curious eye only another form of the well built modern Italian city.

In fact, the inexpressible grandeur of the scenery, the vine-terraced mountains, the purple fumes arising from Etna, the enchantingly graceful outlines of the four-mile crescent forming the harbor, so eclipsed all human work, that the city made little impression.

Situated right at the water's edge, with no possible means of sea defence, Messina was always the first point assaulted by the covetous races bent on possessing the key to the Mediterranean. Hence Messina,

Well : in a district of Mexico celebrated for the growth of the finest cotton, between two streams called Cuitimba and San Pedro, which furnished water for irrigation, lay the farm and homestead of Don Pedro de Jurullo, one of the richest and most fertile properties in that country. He was a thriving man and lived in comfort as a large proprietor, little expecting the mischief that was to befall him.

In June 1759, however, a subterranean noise was heard in this peaceful region. Hollow sounds of the most alarming nature were succeeded by frequent earthquakes, succeeding one another for fifty or sixty days ; but they died away, and in the beginning of September everything seemed to have returned to its usual state of tranquillity. Suddenly, on the night of the 28th of September, the horrible noises recommenced. All the inhabitants fled in terror, and the whole tract of ground, from three to four square miles in extent, rose up in the form of a bladder to a height of upwards of 500 feet.

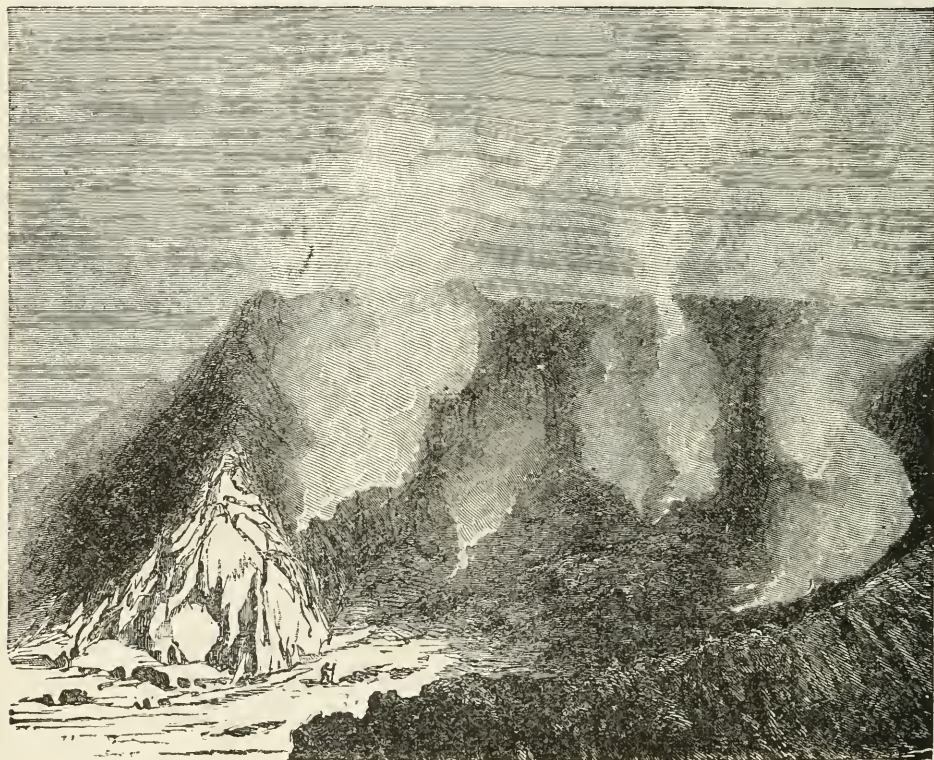
IMMENSE TORRENT OF BOILING MUD.

Flames broke forth over a surface of more than half a square league, and through a thick cloud of ashes illuminated by this ghastly light, the refugees, who had ascended a mountain at some distance, could see the ground as if softened by the heat, and swelling and sinking like an agitated sea. Vast rents opened in the earth, into which the two rivers I mentioned precipitated themselves, but so far from quenching the fires, only seemed to make them more furious. Finally, the whole plain became covered with an immense torrent of boiling mud, out of which sprang thousands of little volcanic cones called Hornitos, or ovens.

But the most astonishing part of the whole was the opening of a chasm vomiting out fire, and red-hot stones and ashes, which accumulated so as to form "a range of six large mountain masses, one of which is upwards of 1600 feet in height above the old level, and which is now known as the volcano of Jurullo. It is continually burning, and for a whole year continued to throw up

island, such as that of Rathlin, remains to attest this former continuity, and to recall to the contemplative mind that sublime antagonism between sudden violence and persevering effort, which the study of geology impresses in every form of repetition.

“There exists a very general impression that earthquakes are preceded and ushered in by some kind of preternatural, and,



NEAR VIEW OF A VOLCANIC CRATER IN SOUTH AMERICA.

as it were, expectant calm in the elements ; as if to make the confusion and desolation they create the more impressive. The records of such visitations which we possess, however striking some particular cases may appear, by no means bear out this as a general fact, or go to indicate any particular phase of weather as preferentially accompanying their occurrence.

“This does not prevent, however, certain conjunctures of atmospheric or other circumstances from exercising a determining

CHAPTER XX.

ERUPTION OF ETNA IN THE YEAR 1865.—MUTUAL DEPENDENCE OF ALL TERRESTRIAL PHENOMENA.—SEA COAST LINE OF VOLCANOES.—THE PACIFIC “CIRCLE OF FIRE.”

THE Greek mythology, harmonizing in this respect with the ideas of most nations which were acquainted with volcanoes, attributed to these mountains an origin altogether independent of the forces which are in action on the surface of the ground. According to the views of the Hellenes, water and fire were two distinct elements, and each had its separate domain, its genii, and its gods. Neptune reigned over the sea ; it was he that unchained the storms and caused the waves to swell. The tritons followed in his train ; the nymphs, sirens, and marine monsters obeyed his orders, and in the mountain valleys, the solitary naiads poured out to his honor the murmuring water from their urns. In the dark depth of unknown abysses was enthroned the gloomy Pluto ; at his side Vulcan ; surrounded by Cyclops, forged thunderbolts at his resounding anvil, and from their furnaces escaped all the flames and molten matter the appearance of which so appalled mankind. Between the gods of water and of fire there was nothing in common, except that both were the sons of Chronos, that is, of Time, which modifies every thing, which destroys and renews, and, by its incessant work of destruction, makes ready a place for the innumerable germs of vitality which crowd on the threshold of life.

Even in our days, the common opinion is not much at variance with these mythological ideas, and volcanic phenomena are looked upon as events of a character altogether different from other facts of terrestrial vitality. The latter, the sudden changes of which are visible and easily to be observed, are justly considered to be owing principally to the position of the earth in respect to the sun and the alternations of light and darkness, heat and cold, dryness and moisture, which necessarily result.

This ring of volcanoes does not exactly coincide with the semicircle formed by the coasts of Australia, the Sunda Islands, the Asiatic continent, and the western coasts of the New World. Like a crater described within some ancient and more extensive outlet of eruption, the great circle of igneous mountains extends



PICTURESQUE VIEW OF LAKE TAUPŌ AND VOLCANIC MOUNTAINS.

its immense curve in a westward direction across the waves of the Pacific, from New Zealand to the peninsula of Alaska; on the east, it is based on the coast of America, rising in the south so as to form some of the loftiest summits of the Andes.

The still smoking volcanoes of New Zealand, Tongariro and the cone of Whakari, on White Island, are, in the midst of the southern waters of the Pacific properly so called. the first evidence

of volcanic activity. On the north, a considerable space extends in which no volcanoes have yet been observed. The group of the Feejee Islands, at which the volcanic ring recommences, presents a large number of former craters which still manifest the internal action of the lava by the abundance of thermal springs. At this point, a branch crossing the South Sea in an oblique direction from the basaltic islands of Juan Fernandez as far as the active volcanoes of the Friendly group, unites itself with the principal chain which passes round, in a northeast direction, the coast of Australia and New Guinea.

GREAT FOCUS OF LAVA STREAMS.

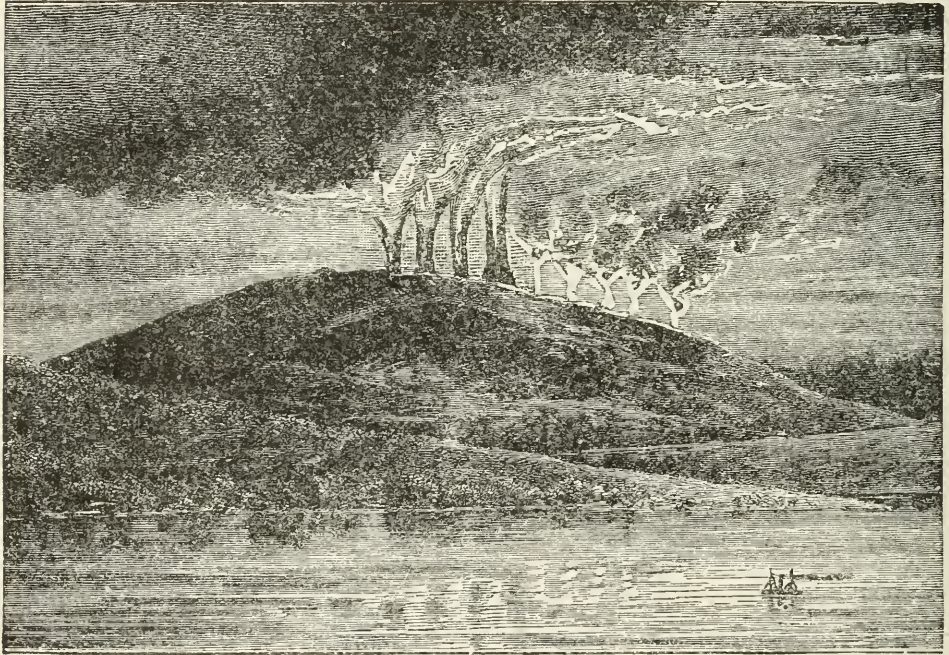
The volcanoes of Abrim and Tanna, in the New Hebrides, Tinahoro, in the archipelago of Santa Cruz, and Semoya, in the Salomon Isles, succeeding one after the other, connect the knot of the Feejees to the region of the Sunda Islands, where the earth is so often agitated by violent shocks. This region may be considered as the great focus of the lava streams of our planet. On the kind of broken isthmus which connects Australia with the Indo-Chinese peninsula, and separates the Pacific Ocean from the great Indian seas, one hundred and nine volcanoes are vomiting out lava, ashes, or mud in full activity, destroying from time to time the towns and the villages which lie upon their slopes; sometimes, in their more terrible explosions, they ultimately explode bodily, covering with the dust of their fragments areas of several thousands of miles in extent.

From Papua to Sumatra, every large island, including probably the almost unknown tracts of Borneo, is pierced with one or more volcanic outlets. There are Timor, Flores, Sumbawa, Lombok, Bali, and Java, which last has no less than forty-five volcanoes, twenty-eight of which are in a state of activity, and, lastly, the beautiful island of Sumatra. Then, to the east of Borneo—Ceram, Amboyna, Gilolo, the volcano of Ternata, sung by Camoens, Celebes, Mindanao, Mindoro, and Luzon; these form across the sea, as it were, two great tracks of fire.

Northward of Luzon, the volcanic ring curves gradually so as

middle central basin of the North Pacific like so many cones of eruption in the midst of a former crater changed into a lake.

The Mauna-Loa and Mauna-Kea, the two volcanic summits of the island of Hawaii, are each more than 13,000 feet in height ; and the eruptions of the first cone, which are still in full activity, must be reckoned among the most magnificent spectacles of this kind. On the sides of the Mauna-Loa opens the boiling crater of



VOLCANO OF TONGARRIRO, NEW ZEALAND.

Kilauea, which is, without doubt, the most remarkable lava-source which exists on our planet.

Round the circumference of the Indian Ocean the border of volcanoes is much less distinct than round the Pacific ; still it is possible to recognize some of its elements. To the north of Java and Sumatra, the volcanoes of which overlook the eastern portion of the basins of the Indian seas, stretches the volcanic archipelago of the Andaman and Nicobar Islands, in which there are several cones of eruption in full activity. On the west of Hindostan, the

CHAPTER XXI.

TORRENTS OF STEAM ESCAPING FROM CRATERS.—GASES PRODUCED BY THE DECOMPOSITION OF SEA-WATER.—HYPOTHESES AS TO THE ORIGIN OF ERUPTION.—GROWTH OF VOLCANOES.

ONE of the most decisive arguments which can be used in favor of a free communication existing between marine basins and volcanic centres is drawn from the large quantities of steam which escape from craters during an eruption, and compose, according to M. Ch. Sainte-Claire Deville, at least 999 thousandths of the supposed volcanic smoke. During the eruption of Etna, in 1865, M. Fouqué attempted to gauge approximately the volume of water which made its escape in a gaseous form from the craters of eruption.

By taking as his scale of comparison the cone which appeared to him to emit an average quantity of steam, he found this mass, reduced to a liquid state, would be equivalent to about 79 cubic yards of water for each general explosion. Now, as these explosions took place on the average every four minutes during a hundred days, he arrived at the result, that the discharge of water during the continuance of the phenomenon might be estimated at 2,829,600 cubic yards of water—a flow equal to that of a permanent stream discharging fifty-five gallons a second. Added to this, account ought to have been taken of the enormous convolutions of vapor which were constantly issuing from the great terminal crater at Etna, and, bending over under the pressure of the wind, spread out in an immense arch around the vault of the sky.

In great volcanic eruptions it often happens that these clouds of steam, becoming suddenly condensed in the higher layers of the atmosphere, fall in heavy showers of rain, and form temporary torrents on the mountain-side. According to the statements of Sir James Ross, the mountain Erebus, of the antarctic land, is

appearance and mineralogical composition. These facts would be eminently impossible, if the craters were fed from the same source.

Etna, the group of the Lipari Isles, and Vesuvius, have often been quoted as being volcanic outlets placed upon the same fracture of the terrestrial crust; and it is added, in corroboration of this assertion, that a line traced from the Sicilian volcano to that of Naples passes through the ever-active furnace of the Lipari Isles. Although the mountain of Stromboli, so regular in its eruptions, is situated on a line slightly divergent from the principal line, and, on the other side, the volcanic isles of Salini, Alicudi, and Felicudi tend from east to west, it is possible, and even probable, that Vesuvius and Etna are in fact situated on fissures of the earth which were once in mutual communication. But during the thousands of years in which these great craters have been at work, no connection between their eruptions has ever been positively certified.

TWO INDEPENDENT VOLCANOES.

Sometimes, as in 1865, Vesuvius vomits forth lava at the same time as Etna; sometimes it is in a state of repose when its mighty neighbor is in full eruption, and rouses up when the lava of Etna has cooled. There is nothing which affords the slightest indication of any law of rhythm or periodicity in the eruptive phenomena of the two volcanoes. The inhabitants of Stromboli state that, during the winter of 1865, at the moment when the sides of Etna were rent, the volcanic impulse manifested itself very strongly in their island by stirring up the always agitated waves of the lava-crater which commands their vineyards and houses.

A comparative calm, however, soon succeeded this temporary effervescence, and in the adjacent island of Volcano no increase of activity was noticed. If the shafts of Etna, Vesuvius, and the intervening volcanoes, take their rise in one and the same ocean of liquid lava, all the lower craters must necessarily overflow simultaneously with the most elevated. Now, as has often been

noticed, the lava may ascend to the summit of Etna, at a height of 10,827 feet, without a simultaneous flow of rivers of molten stone from Vesuvius, Stromboli, and Volcano, which are respectively but one-third, one-fourth, and one-tenth the height of the former. In like manner, Kilauea, situated on the sides of Mauna-Loa, in the Isle of Hawaii, in no way participates in the eruptions of the central crater opening at a point 9800 feet higher up, and not more than twelve miles away.

If there is any present geological connection between the volcanoes of one and the same region, it probably must be attributed to the fact of their phenomenal depending on the same climatic causes, and not because their bases penetrate to one and the same ocean of fire. Volcanic orifices are not, therefore, "safety valves," for two centers of activity may exist on one mountain without their eruptions exhibiting the least appearance of connection.

OPINIONS OF MEN OF SCIENCE.

Isolated as they are amid all the other formations on the surface of the earth, lavas appear as if almost independent of the rest. Basalts, trachytes, and volcanic ashes, are the comparatively modern products which are scarcely met with in the periods anterior to the Tertiary age. Only a very small quantity of these lavas of eruption has been found in the Secondary and Palæozoic rocks. Formerly, most geologists thought that the granites and rocks similar to them had issued from the earth in a pasty or liquid state; they looked upon them as the "lavas of the past," and believed that these first eruptive rocks were succeeded age after age by the diorites, the porphyries, the trap-rocks, then by the trachytes and the basalts of our own day, all drawn from a constantly increasing depth.

They thought also that, in the future, when the whole series of the present lavas shall have been thrown up to the surface, volcanoes would produce other substances as distinct from the lavas as the latter are from the granite. Granites, however, differ so much from the trachytes and basalts as to render it impossible for us to imagine that they have the same origin; added to which,

the labors of modern savants have proved that, under the action of fire, granite and the other rocky masses of the same kind, would have been unable to assume the crystalline texture which distinguishes them. We are, then, still ignorant how volcanic eruptions commenced upon the earth, and how they are connected with the other great phenomena which have co-operated in the formation of the external strata of the globe.

Considered singly, each volcano is nothing but a mere orifice, temporary or permanent, through which a furnace of lava is brought into communication with the surface of the globe. The matter thrown out accumulates outside the opening, and gradually forms a cone of debris more or less regular in its shape, which ultimately attains to considerable dimensions. One flow of molten matter follows another, and thus is gradually formed the skeleton of the mountain; the ashes and stones thrown out by the crater accumulate in long slopes; the volcano simultaneously grows wider and higher.

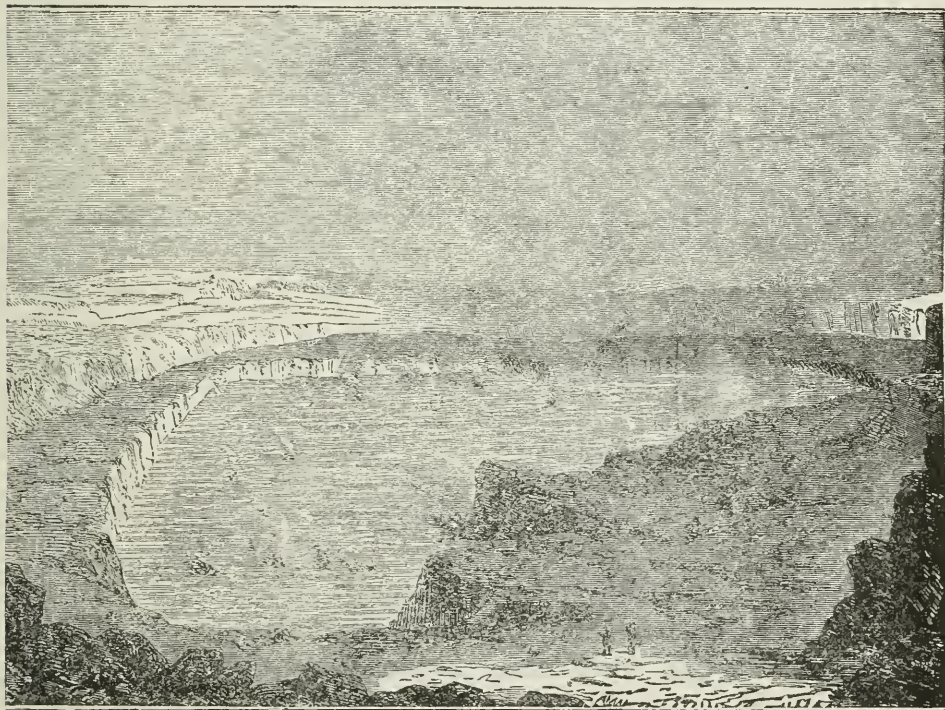
MOUNTS INTO CLOUDS AND SNOW.

After a long succession of eruptions, it at last mounts up into the clouds, and then into the region of permanent snow. At the first outbreak of the volcano the orifice is on the surface of the ground; it is then prolonged like an immense chimney through the center of the cone, and each new river of lava which flows from the summit increases the height of this conduit. Thus the highest outlet of Etna opens at an elevation of 10,892 feet above the level of the sea; Teneriffe rises to 12,139 feet; Mauna-Loa, in Hawaii, to 13,943 feet, and, more gigantic still, Sangay and Sahama, in the Cordilleras, attain to 18,372 and 23,950 feet in elevation.

This theory of the formation of volcanic mountains by the accumulation of lava and other matters cast out of the bosom of the earth presents itself quite naturally to one's mind. Most savants, from Saussure and Spallanzani down to Virlet, Constant Prévost, Poulett Scrope and Lyell, have been led, by their investigations, to adopt it entirely; indeed, in the present day it is

horizon far and wide with their enormous cones. Between the Merapi and Lavoe mountains lies a depression, the highest ledge of which exceeds the level of the sea by only 312 feet. Between Lavoe and Villis the plain is 230 feet in height. Lastly, the plains which separate the Villis and Kelœet mountains nowhere attain an elevation of more than 200 feet above the ocean.

In the external details of their conformation many of the vol-



A REMARKABLE VOLCANO CRATER, ISLE OF JAVA.

canoes of Java present a regularity of outline which is all the more striking, since they owe it in great part to the monsoon rains, the most destructive agents of the tropical regions. In beating against the mountains, the clouds let fall their burden of moisture on the slopes composed of ashes and loose scorixæ. The latter offer but a slight resistance to the action of the temporary torrents which carry them away, and, crumbling down into the

CHAPTER XXII.

VARIOUS KINDS OF LAVA.—BEAUTIFUL CAVE IN SCOTLAND.—
CREVICES IN VOLCANOES.—SNOW UNDER BURNING DUST.

LAVA is the most important product of the volcanic fires. The various kinds of lava differ very much in their external appearance, in the color of their substance, and in the variety of their crystals, but they are all composed of silicates of alumina or magnesia, combined with protoxide of iron, potash or soda, and lime. When the feldspathic minerals predominate, the rock is generally of a whitish, grayish or yellowish hue, and receives the name of trachyte. When the lava contains an abundance of crystals of augite, hornblende, or titaniferous iron, it is heavier, of a darker color, and often more compact; it then takes the generic formation of basalt. Numerous varieties, diversely designated by geologists, belong to this group.

Of all the lavas, trachyte is the least fluid in its form. In many places rocks of this nature have issued from the earth in a pasty state, and have accumulated above the orifice in the shape of a dome, "Just like a mass of melted wax." In this way were formed the great domes of Auvergne, the Puys de Dome and de Sarcouy. In this district the flows of trachytic lava are far inferior in length to the basaltic cheires; the most important do not exceed four or five miles in length.

At the present day, eruptions of trachyte are much more rare than those of other lavas; so much so, that certain authors class all the trachytic rocks among the formations of anterior ages. It is, however, ascertained that most of the American volcanoes and those of the Sunda Archipelago vomit out lava of this nature; the last eruptions of the Æolian Isles, Lipari and Volcano, likewise produced only trachyte and pumice-stone.

This latter substance resembles certain white, yellow, or greenish scoria, which issue like a frothy dross from the furnaces

Although lava, when cooled, is easy enough to study, it is more difficult to observe with any exactitude the molten matter immediately on its exit from the craters or fissures; besides this, the opportunities for study which are afforded to savants are sometimes very dangerous. Long years often elapse before an enquirer can notice at his ease, and without fear of sudden explosions, the mouths of *Ætna* or *Vesuvius* filling up to the brink with boiling lava.

Stromboli is the only volcano in Europe in which this phenomenon occurs regularly at closely-recurring intervals, sometimes of only five minutes, or even more frequently. When an observer stands on the highest edge of the crater, he sees, about 300 feet below him, the waves of a matter which shines like molten iron, and tosses and boils up incessantly; sometimes it swells up like an enormous blister, which suddenly bursts, darting forth eddies of vapor accompanied by solid fragments.

HAS BOILED FOR CENTURIES.

For centuries past the lava has never ceased to boil in the cavity of *Stromboli*, and it is but very rarely that a period of even a few hours lapses without molten matter overflowing. Thus the crater, which, during the day, is white with steam, and during the night red with the glare of the lava, has served as a light-house for mariners ever since the first vessel ventured upon the *Tyrrhenian Sea*.

In *Nicaragua*, to the north of the Great Lake, the volcano of *Masaya* (or "*Devil's Mouth*") presents a spectacle similar to that of *Stromboli*, but grander, and perhaps still more regular. After having remained in a state of repose for nearly two centuries, from 1670 to 1853, the monster—which has received the name it bears from the frightful turbulence of its burning waves—resumed all its former activity. In this crater the enormous bubbles of lava, which ascend from the bottom of the abyss and throw out a shower of burning stones, break forth in a general way every quarter of an hour.

The volcano of *Isalco*, not far from *Sonsonate*, in the State of

CHAPTER XXIII.

VOLCANIC PROJECTILES.—EXPLOSIONS OF ASHES.—SUBORDINATE VOLCANOES.—MOUNTAINS REDUCED TO DUST.—FLASHES AND FLAMES PROCEEDING FROM VOLCANOES.

THE lava swelling up in enormous blisters above the fissures from which it flows in a current over the slopes is far from being the only substance ejected from volcanic mountains. When the pent-up vapor escapes from the crater with a sudden explosion, it carries with it lumps of molten matter, which describe their curve in the air, and fall at a greater or less distance on the slope of the cone, according to the force with which they were ejected.

These are the volcanic projectiles, the immense showers of which, traced in lines of fire on the dark sky, contribute so much during the night time to the magnificent beauty of volcanic eruptions. These projectiles have already become partially cooled by their radiation in the air, and when they fall are already solidified on the outside, but the inside nucleus remains for a long time in a liquid or pasty state. The form of these projectiles is often of an almost perfect regularity.

Each sphere is in this case composed of a series of concentric envelopes, which have evidently been arranged in the order of their specific gravity during the flight of the projectile through the air. The dimensions of these projectiles vary in each eruption; some of them are one or more yards in thickness; others are nothing but mere grains of sand, and are carried by the wind to great distances.

In most eruptions, these balls of lava, still in a fluid and burning state, constitute but a small part of the matter thrown out by the mountain. The largest proportion of the stone ejected proceeds from the walls of the volcano itself, which break up under the pressure of the gas, and fly off in volleys, mingled with the products of the new eruption. This is the origin of the dust or

mountains often contains a large quantity of organized beings, aquatic plants, infusoria, and even fish, which could only have lived in the calm waters of a lake.

Of this kind is the *Pimelodes cyclopum*, a little fish of the tribe of the Silurida, which according to Humboldt, has hitherto been found nowhere except in the Andini caverns and in the rivulets of the plateau of Quito. In 1691 the volcano of Imbambaru vomited out, in combination with mud and snow, so large a quantity of these remains of organisms that the air was contaminated by them, and miasmatic fevers prevailed in all the country round. The masses of water which thus rush down suddenly into the plains amount sometimes to millions, or even thousands of millions of cubic yards.

UNDERGROUND LAKES.

Although, in some cases, these eruptions of mud and water may be looked upon as accidental phenomena, they must, on the contrary, as regards many volcanoes, be considered as the result of the normal action of the subterranean forces. They are, then, the waters of the sea or of lakes which, having been buried in the earth, again make their appearance on the surface, mingled with rocks which they have dissolved or reduced to a pasty state.

A remarkable instance of these liquid eruptions is that presented by Papandayang, one of the most active volcanoes in Java. In 1792 this mountain burst, the summit was converted into dust and disappeared, and the debris, spreading far and wide, buried forty villages. Since this epoch a copious rivulet gushes out in the very mouth of the crater, at a height of 7710 feet, and runs down into the plain, leaping over the blocks of trachyte. Round the spring pools of water fill all the clefts in the rocks, and boil up incessantly under the action of the hot vapors which rise in bubbles; here and there are funnel-shaped cavities, in which black and muddy water constantly ascends and sinks with the same regularity as the waves of the sea; elsewhere, muddy masses slowly issuing from small craters flow in circular slopes over mounds of a few inches or a yard in height; lastly, jets of steam dart out of

CHAPTER XXIV.

VOLCANIC THERMAL SPRINGS. — GEYSERS. — SPRINGS IN NEW ZEALAND.—CRATERS OF CARBONIC ACID.

VOLCANOES, both of lava and mud, all have, either on their sides or in the vicinity of their base, thermal springs, which afford an outlet to their surplus water, gas, and vapor. Most even of those mountains which are at present tranquil, but which were once centres of eruption, continue to manifest their activity by vapors and gas, like furnaces in which the flames are extinct, but the smoke is still rising. Although lava and ashes no longer make their escape from the crater of lateral fissures, yet numerous hot springs, formed by the condensation of the steam, generally serve as a vehicle for the gas pent up in the depths of the mountain.

We may reckon by hundreds and thousands the "geysers," the "vinegar springs," and other thermal springs in countries once burning with volcanoes, the fires of which are extinct, or at least quieted down for a period more or less protracted. Thus the former volcanoes of Auvergne; the mountains of the Eifel, on the Rhine, the craters of which contain nothing but lakes or pools; the Demavend, with its mouth filled up with snow—all still exhale here and there, through springs, as it were, a feeble breath of their once mighty vitality.

The volcanic regions of the earth where thermal springs gush out, are very numerous. In Europe we have Sicily, Iceland, Tuscany, and the peninsula of Kertch, and Yellowstone Park, in America—land so rich in volcanoes—the springs warmed by subterranean vapor are still more numerous, and there are some on the sides of the volcano Nuevo del Chillan which gush out through a thick bed of perpetual snow.

A lateral gorge of the valley of Napa, in California, called the "Devil's Canyon," may be quoted as one of the most striking examples of the active production of thermal waters. The narrow

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